



FRIDAY, JUNE 11, 1880.

## AMERICAN SOCIETY OF CIVIL ENGINEERS.

## Report of the Twelfth Annual Convention.

(CONCLUDED FROM PAGE 299.)

The closing day's session of the annual convention of the American Society of Civil Engineers was called to order Thursday, May 27, at 10 o'clock, by the Chairman, Captain James B. Eads.

The first paper was read by Mr. Ashbel Welch on the "Operation of Ship-Canal Locks by Steam." The speaker said the few who had studied this subject had rarely written about it, because no one cared to read it. The thoughts he had to present were suggested by the recent discussions regarding the Panama Canal. He had no opinions to offer regarding the various canal and railroad plans for establishing communication for ocean vessels across the Isthmus. The great difficulty in the construction and operation of such canals was in the locks which were built to avoid the enormously expensive deep cuts necessary to secure a level canal. Formerly the strength of a man was sufficient to open and close the locks of the inland canals, and horse power was sufficient to haul the boat. For ocean vessels, however, the increase of power and capacity required was so great that many engineers held that locks would never be safe and practicable to use for the largest class of vessels. The speaker went on to show, however, that by use of steam and by adopting various devices of construction such locks could be operated without difficulty. The foundation of such locks was the one vital thing. The European engineers proposed a simple flooring of concrete, but in order to avoid the consequences of cracking he proposed to overlay the concrete with a flooring of timbers. He proposed to have ten openings in the side walls to admit and discharge the water. The gates could be raised in half a minute and the lock filled in two minutes. The largest ship could be hauled into the lock in five or six minutes. The vessel need never be allowed to touch the side of the locks or the gates. The cost of such locks as contemplated would be about \$2,000,000 each and \$50,000 per annum to operate.

## THE JETTIES.

Max E. Schmidt presented a short paper on the condition of the jetty channel, which was read by the Secretary. The paper contained the following statement:

"At the head of the passes the 30-foot channel is now 450 ft. wide with a least depth of 30.1 ft. The improvement during the last year has been constant and more marked than at any period heretofore. At the jetties proper, the channel has again improved in depth and width. There has not been a single day in the last six months on which the 30-foot channel has been found defective, and during that time the dredge-boat has been in service only 11½ days, when work was required near the sea ends of the jetties, where slight fluctuations in the bottom, nominally closing the 30-foot channel, must be expected to take place, owing to the action of the waves and the effect of the storms upon the mouth. But the consolidating works now in progress at the ends of the jetties once completed, there will be a permanent central depth of 30 ft. and more, which will be wholly maintained by the action of the current. No examination has been made of the Gulf bottom seaward of the jetties since December, 1879, when a comparison with surveys of 1878 showed a scour of 770,087 cubic yards or an average increase in depth of 1.23 ft. The construction of the concrete capping on the east jetty is nearly finished. It will ultimately extend over a distance of 5,159 linear ft., commencing at a point 6,500 ft. from the eastern land's end and ending at the sea end."

Capt. Eads said the depth of 30 feet near the head of the channel was reckoned at low water of the river. At the present stage of water there would be two or three feet greater depth.

The volume of the channel was sufficient to maintain a certain section. In order to maintain the 30-foot channel 450 ft. wide it was necessary to keep a certain amount of 26-foot depth. Sometimes the 26-foot water would spread out too wide at the sides, and then the 30-foot channel would shoal a few inches. The east jetty was now being consolidated, the west jetty being completed. The only place where there was any shoal in the channel was near the mouth of the pass. In two years he had not a doubt but that the least depth throughout the channel would be 32 ft. The completion of the work on the east jetty would quickly affect this shoal.

## THE TAY BRIDGE.

Mr. Welch read a paper suggested by the Tay bridge accident. In discussing the power of the iron foundations on so lofty a structure to withstand the horizontal pressure of a storm, he said that by the result of his experience he believed the calculations of the English engineers regarding the strength of the pressure to which the bridge were subjected were very much too low, and he thought this underestimate of the force of lateral currents of wind or water would explain some other bridge phenomena. He gave statements as to the extent of surface presented by the trestle and estimates of the pressure exerted by the wind at different velocities.

Discussion was invited, but was temporarily postponed. R. E. McMat, of the United States topographical engineers' service, read a paper on "Practical Consequences of Variations of the Wet Sections of Rivers under General and Special Conditions." The address contained valuable suggestions regarding the improvement of rivers, but was not of a character to interest the general reader.

A paper on "Quebec Harbor Improvements," by J. V. Nant Browne, was ordered printed with the proceedings.

The chair said he understood that Mr. Cooper, of New York, had something to say regarding the paper presented by Mr. Welch on the Tay bridge disaster.

## FORCE OF AIR CURRENTS.

Mr. Cooper said very little was known of the effect of wind pressure. Few experiments or tests had been made and few formulae published. It seemed to him that several very important elements remained to be determined definitely. The form of an obstruction must modify the force of wind pressure. A flat surface would offer a different resistance from an angular one. Then the "lee" was an important element to be considered. It was customary with many to reckon the lateral pressure against a trestle by the surface presented on the outside columns and supports. He had seen the report of tests showing that where two columns or plates stood within nine inches of each other, the one directly intercepting the current of wind from the other, the pressure on the second was still three-fourths as great as that upon the first. It was evident that the wind did not act in straight lines, but followed a kind of wave action. Nor was it in steady currents. Frequent gusts

were observed, that was, when the observer happened to be on the crest or edge of a wave. Then a comparative quiet will follow after the crest had passed by. Suppose these gusts or waves were tolerably regular in intervals for a short time and should strike the tall tower of a bridge in unison with the time of its oscillation, the tower must necessarily fall before a not very heavy breeze. He had understood that the chief of the signal service was willing to make experiments for the purpose of determining something regarding these matters, and that he was desirous of having an expression from this Society as to the most effective means of making the trials. As regarded the Tay bridge disaster, the speaker stated that recently, while in England, he had an opportunity of examining another structure supported in manner similar to the Tay bridge. That was the Cumberland viaduct. The towers were 240 ft. high, and, after an examination, he was satisfied that should the structure ever encounter such a wind, not a tornado, as is not at all uncommon in this country, it would go down just as the Tay bridge had done. He hoped some action would be taken to have this subject more fully developed.

Mr. Briggs was called on for an expression of opinion on this subject. He said he was not prepared to discuss the question, but he would gladly second any action taken to secure information regarding it.

C. Shaler Smith moved the appointment of a committee of three to communicate with the chief of the signal service on the subject.

The motion carried, and the Chair appointed Messrs. Smith, Cooper and Briggs as such committee.

The Chair said one thing to be taken into account in estimating the effect of wind on bridges was that high above the earth the force of the wind was much greater than at the surface. In the St. Louis Bridge they had taken precautions against all ordinary storm winds but not against tornadoes, considering that the chance of a tornado striking a single point of that size was too small to warrant the enormous expense of making it secure against such a shock, were that possible. A tornado while the bridge was in course of erection lifted a locomotive off the track in East St. Louis.

Mr. Smith said that he, with Prof. Nipher, had an opportunity to follow the track of the recent tornado at Marshfield about eighty miles. The path of its recent devastations was about 1,800 ft. wide, the widest he had ever known, and it developed a lifting strength sufficient to carry a piano some 200 ft. and set it down lightly without injury. The house from which the piano was taken was a brick structure with 13-inch walls. No brick work was left more than 2 ft. above the foundation. He found no means of determining the lateral force of the wind. The tornado which struck St. Charles several years ago was equally violent, but its path was not more than about 60 ft. wide. The point of the funnel-shaped vortex constituting the tornado swung back and forth over an area 2,000 ft. wide, but generally swept a path not wider than 60 ft. This tornado struck the centre span of the St. Charles Bridge with force sufficient to take up a barrel of tar, break it open and smear the tar on all sides of the trestle supports, showing that the bridge was actually in the whirl of the central vortex. He had no doubt that the bridge would have fallen had the nucleus of the storm been 200 ft. wide instead of 60 ft.

Mr. Briggs said there was very little mystery about the tornado. The conditions required to produce it were an almost total absence of atmospheric disturbance over a wide area, united with summer weather. The heating of the lower stratum of air caused it to rise, and of course there would be a rush of air along the surface from all directions to fill the rarefied space. This naturally generated the whirling column which, set in motion, usually followed a devious track and caused great destruction. One of the most marked he had ever had opportunity to observe was near Medford, Mass., in 1850. It swept away all the stone walls in its path and showed a tremendous lateral pressure.

The chair stated that the capacity of the St. Louis Bridge to resist wind was reckoned by considering the latticed work of the structure equal to a close wall covering its whole surface. It was estimated to be safe under a pressure of 100 lbs. per square foot.

Mr. Francis said he had occasion to examine the Havre de Grace Bridge which was blown down some years ago, and he made up his mind then that the only way to make a bridge safe against wind was to make it just as strong laterally as vertically.

Mr. Smith said he had an opportunity to examine the Havre de Grace ruins a few hours after the storm passed. It took a pressure of 13 lbs. to the inch to overturn it, but it went over.

The chair announced the following as the committee to memorialize Congress for the purpose of having government work placed in charge of civil engineers: Charles Macdonald, J. J. R. Croes, Albert Fink, A. Dempster, Thomas E. Clarke, Henry Flad and J. E. Hilgard.

A resolution of thanks was adopted to all the corporations and bodies that had extended courtesies to the convention; also a resolution of thanks to the local committees.

The convention then adjourned sine die.

## THE EXCURSION.

At half-past two o'clock carriages left the Lindell Hotel, with four parties of excursionists. One party, under charge of Capt. O. H. Ernst and D. M. Currie, took passage on the steamer A. A. Humphreys, and started on a trip to Horse-tail Dike. The boat stopped at the landing opposite the cotton compress company's works, and took on board a part of a second party who desired to witness the process of compressing the bales. Prof. Charles A. Smith guided another party out to the Harrison wire-works; thence through Lafayette Park, the gates of which were opened for the visitors to drive through; thence out to Capt. Eads' residence, where they were most hospitably entertained by Capt. Eads, Major Estill McHenry and the ladies of the household. Thence the party proceeded to take a flying glance at the Compton Hill reservoir, Shaw's Garden, and last, not least, Lemp's brewery. The visitors were supplied with candles and shown through the vaults, which rather surprised a good many of them.

Anheuser's brewery was also visited by many of the sight-seers. Col. Ike Cook also helped Messrs. Claude Freeman and P. W. Shaumleffel to pilot a party around town. They visited the wood-preserving works, the white lead works, the Fair grounds and the cellars of the American Wine Company. Some of the different parties improvised little excursions of their own and hunted out all sorts of interesting places, but all were back at the rendezvous in time for the evening banquet at Masonic hall.

## THE BANQUET.

The banquet in the evening, at Masonic hall, was an elegant affair. At 9 15 ninety ladies and gentlemen sat down. The following was the Menu:

"Great care should be taken to prepare the foundation so that the weight of superstructure will be equally distributed."

Little Neck Clams on the Half-Shell.  
Chablis.

"All materials will be subject to inspection and rigorous

tests, and if found of improper quality, must be immediately removed from the work."

Crème d'Asperges à la comtesse, Potage.

Sherry Amontillado, Consommé à la Reine,

"All the spaces must be filled; one course must be imperious to water before the next is laid."

Boiled Red Snapper, à la Hollandaise, Poisson.

Croquettes de Pommes de Terre, Sheep's Head, Sauce Hollandaise,

Haut Barsac, Salmon, Sauce Anchoi,

"Each course must be thoroughly grouted with liquid cement formed of the best materials."

Warm Entrées, Saddle of Lamb, à la Purée d'Artichauts,

Filet de Bœuf aux Champignons, Ris de Veau aux Petit Pois,

Grenouilles, à la Crapaudine, Sauce Bernaise,

Pontet Canet, Cold Entrées,

Mayonnaise de Volaille, Jambons Glacés,

Cauliflower, au gratin, Asparagus,

"Any doubt as to the meaning of these specifications, or any obscurity in the wording of them, shall be explained by the engineer in charge."

Spanish Olives, Sliced Tomatoes,

Punch à la Romaine, English Pickles,

"Each course shall be well bonded with the one beneath."

Shrimp Salad, Water Cresses, Lettuce Salad,

"There shall be at least one header for every three stretchers."

Mum's Extra Dry, Champagne, Napoleon Cabinet,

Corbeille de fruits, Strawberries, Assorted Cakes,

Charlotte Russe, Lemon Ices in Moulds,

Champagne Jelly, Vanilla Cream in Moulds, Cigars.

Cognac, Coffee,

"Any work or material required to make a neat and perfect job shall be furnished, no matter whether it has been specifically stated or not."

The following were the toasts and responses:

The City of St. Louis, the future metropolis of the American continent.

Response by Judge Lightner.

The American Society of Civil Engineers, whose discussions determine how marshes shall be drained, mountains pierced, rivers bridged and distance annihilated.

Response by Mr. Chas. Macdonald, C. E.

The Local Committee, whose arrangements for our entertainment and instruction fitly terminate in this supply of fuel to replenish the energy expended in our dynamic efforts.

Response by Wm. P. Shinn, C. E.

Our visiting members: May they return to their homes feeling that our hearts are as warm as the sun in our skies.

Response by Mr. J. J. R. Croes, C. E.

The builders of our great bridges: May their courage grow with the spans they venture,

Response by C. Shaler Smith, C. E.

The Father of Waters, his paternal strength to be used to feed and clothe the northern countries.

Response by James B. Eads, C. E.

The hydraulic triumvirate, the Nestors of our Profession—Francis, Chesbrough and Worthen.

Response by Wm. E. Worthen, C. E.

The "Iron Mountain Route," the gateway to the treasures of the Montezumas.

Response by A. W. Soper.

The Manufacturing Interests of the Western Metropolis: May they grow commensurate with the mighty resources nature has laid at her feet.

Response by Albert Todd.

Woman—Her desires the first impulse to civilization; her smile the engineer's brightest reward.

Response by Edward R. Andrews, C. E.

The American Railways—The great arteries of transcontinental commerce.

Response by Mr. Moore.

The twelfth annual session of the American Society of Civil Engineers in the City of St. Louis is reported to have been one of the most successful in the annals of the Society.

For our reports of it we are indebted to the daily papers of St. Louis.

## MASTER MECHANICS' ASSOCIATION.

## Thirteenth Annual Convention.

We have already given a brief report of the proceedings of the Convention at Cleveland, which we now supplement by a summary of the discussions prepared from the official report.

## FIRST DAY.—PRELIMINARY PROCEEDINGS.

The opening proceedings, with the President's address, the Secretary and Treasurer's reports and the usual routine work were given in sufficient detail in our previous report. (Page 255.)

The first committee report presented was that of the Committee on Locomotive Boilers (already published on page 255), which was read and received, and submitted for discussion.

Mr. FORNEY presented a letter from Mr. Stefan Verderber relating to the performance of boilers built upon his plan without water-space around the fire-box, and referred to in the report just read. He said that he had considered the matter of so much importance that he had entered into correspondence with Mr. Verderber, in relation to his plan of boiler construction, and his experiments therewith. So far he had obtained very good results. Mr. Verderber had also made experiments on the Hungarian state railroad's with copper and iron tubes in locomotive boilers and had found the advantage to be with the iron tubes, both in prevention of leakage and consumption of coal. In the Verderber boiler the water spaces around the fire-box are dispensed with, the fire-box being lined with fire-brick. Only the tube-sheet and a few inches of the cylinder part of the boiler are exposed to the direct action of the fire, the tube surface being the medium through which the heat generated in the fire-box is conveyed to the water. He thought this an extremely hopeful direction in which to look for improvement



If his plan should prove successful on further trial, they ought all to give it careful study and attention and seek to introduce it. At present it seemed to be a great step forward, and well worth full trial.

Further discussion was then postponed until next day.

#### LOCOMOTIVE CONSTRUCTION.

The report of the Committee on Performance of Locomotives (published on page 265) was then read and received.

Mr. SPRAGUE referred to the statement in the report as to the comparative number of American, Mogul and Consolidation engines built at the Baldwin Works. He thought that this statement hardly gave a fair comparison, as a considerable number of Mogul engines had been built for narrow-gauge roads, and the tendency was to use Moguls more on such roads than on those of standard gauge. The Denver & Rio Grande narrow-gauge also had quite a number of Consolidation engines.

Mr. WOODCOCK believed the Denver & Rio Grande were using Consolidation engines entirely. He believed that class of locomotives was gaining in favor rapidly.

Mr. HAYES said that the Consolidation engine was going ahead in some parts of the country, but in the West they were getting Mogul engines for heavy freight work. On his road they had some Moguls with 19-in. cylinders, but were now getting them with 20-in. cylinders. He had seen one of these haul 100 four-wheel cars without trouble. They had never had any trouble with them and were running now with 65 box cars in a train. He was in favor of that class of engine for freight service, although the Consolidation engines might be very good for working heavy grades.

Mr. SPRAGUE thought the committee decidedly favored the Consolidation engines. He knew that they were in more favor in the East than in the West.

Mr. HAYES thought that the Consolidation engine was not used on Western roads. The Mogul was being adopted everywhere, especially on roads running through freight. His road had recently bought a number, and they were coming into use everywhere for through freight, the eight-wheel or American engine being retained for passenger and local freight service.

Mr. SEDGLEY further explained the statements made by him and included in the Committee's report. The engines had been tried fairly and without discrimination. The Moguls hauled more cars and cost less for fuel. The engines were in pretty hard service, running very heavy trains, an average of 40 cars to a train. The boilers were hardly large enough for so heavy a train. The speed did not exceed 15 miles an hour. Taking the ordinary service for a year, the Moguls had done better than the eight-wheel engines. He believed that where there was a heavy business, which would supply regularly heavy trains far better results could be obtained with the Mogul than with the eight-wheel engine. With the Mogul it was not necessary to carry as heavy a fire; the greater adhesion enabled them to utilize the steam better.

Mr. SPRAGUE inquired if any member was using Mogul and Consolidation engines together.

Further discussion on this report was then postponed to the next day.

The hour having arrived for proposing and discussing questions, the first one taken up was in relation to

#### BOILER RIVETING.

Mr. SETCHEL said that on a recent visit to the Louisville & Nashville shops where riveting was used, he had noticed that most of the riveting was done by laborers, only one skilled man being employed about a boiler. The work was done very cheaply, and he was assured by the parties in charge that it was entirely reliable, and that they had no trouble with their boilers leaking. Others to whom he had spoken about it had condemned the practice, saying that where this kind of riveting was used, the rivet-holes were often not properly filled, and the seams not as tight as they ought to be. If they could use unskilled labor in making their boilers it would cheapen construction very much. He thought that, while the holes might not be so well filled the plates were drawn together more strongly than by hand riveting, as the operation was finished more quickly and while the rivet was hotter—in other words more is gained by button riveting than by hand riveting filling up the holes. It was certainly much cheaper.

Mr. BOON had found some years ago that hand riveting by unskilled labor gave considerable trouble. In steam riveting the cost was about 50 per cent. less, and where the rivets were properly driven it made a very good job, far superior to hand riveting.

Mr. SETCHEL said that the process he referred to was not steam riveting, but in which one man had a "set" put over the rivet, while a couple of laborers did the hammering.

Mr. HAYES said that this process had been used in one shop in Chicago for years, one man putting a set over the rivet while two laborers hammered it. It was certainly cheaper, and he agreed that its advantages would counterbalance the disadvantage that the holes were not so well filled.

Mr. SPRAGUE said that filling the holes depended upon the method used. There is one method in which the rivet is heated, the point then cooled down, and it could be hammered with a set, the hole being as well filled as by ordinary hand riveting.

Mr. HAYES thought that when a rivet had been driven by hand there was much more heat in it than when it was driven by machine, and it would contract in cooling.

Mr. SPRAGUE thought that by the time a man had finished hammering on the head the heat would be pretty well gone.

Mr. SEDGLEY thought that button-set riveting was generally considered inferior to hand riveting. He did not wish, however, to be considered as opposed to steam riveting.

Mr. HAYES asked what the difference was, if the tool used in steam riveting was substantially the same as the button set.

Mr. SEDGLEY said that there was a great difference. It was not possible for a man to exert the same force on the set with a maul as could be exerted by a steam cylinder, or to set the rivet as firmly.

Mr. HAYES thought that the work was done more quickly, but doubted whether it was much better. The point was whether it was better to use the button set or the old process of hand riveting. In hand and steam riveting with the button set there was no difference in the form of the rivet, and if the blow struck by a man with a sledge filled up the hole, the result was just as good as with a steam riveting-machine. If the results had been satisfactory on a large road and no leaky boilers were reported, there must be something in it.

Mr. SEDGLEY agreed that if button-set riveting filled the holes it was just as good, but he did not believe it possible to do the work as well by hand as by steam. The hand process had been introduced 30 years ago and then given up.

Mr. YOUNG had seen a great many bad specimens of button-set riveting, but thought they were caused by bad workmanship. He believed a good job could be made in that way.

Mr. LAUDER said that a good deal of button-set riveting was done 30 years ago, and he thought they would be using it still if it was the best. It would not have died out if satisfactory work had been done.

Mr. HAYES said that they were all using some button-set riveting in their boilers to-day. Steam riveting was nothing else.

Mr. LAUDER thought that there must be a difference be-

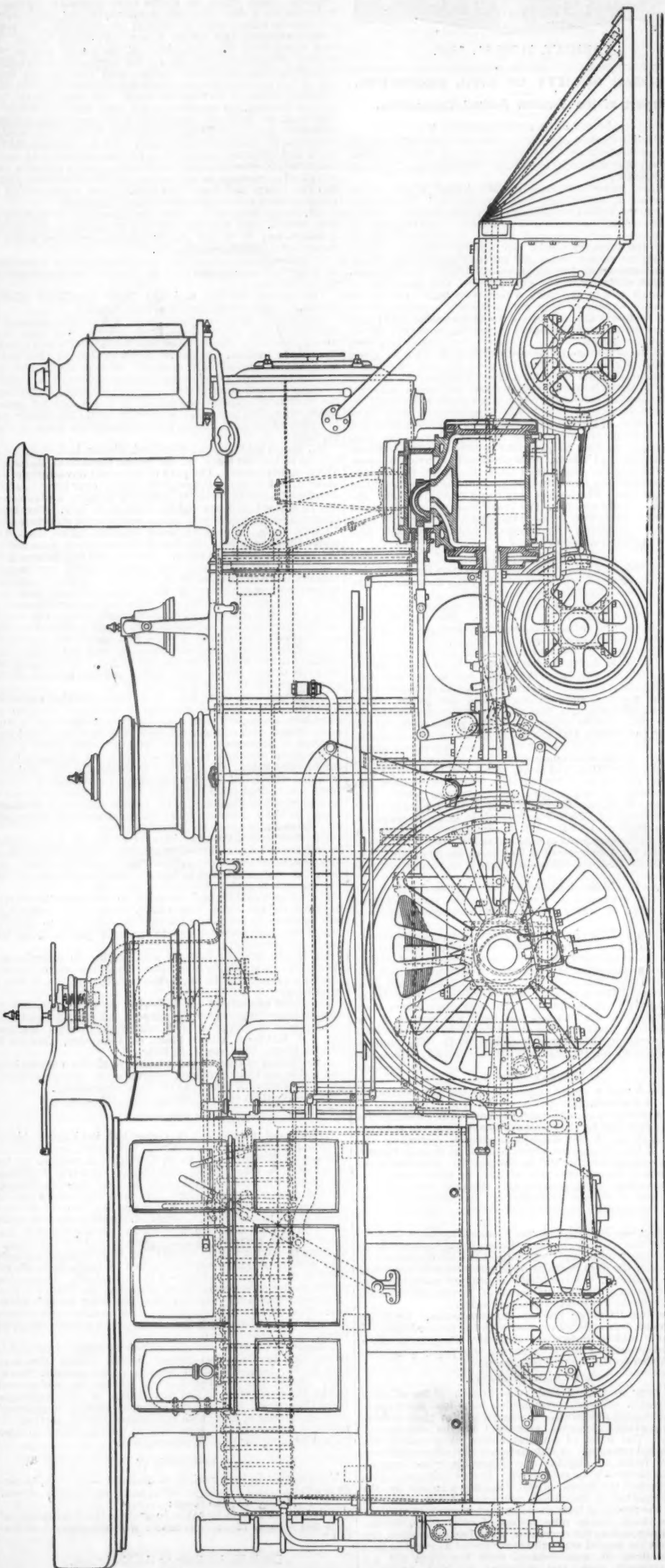


Fig. 1.  
FAST PASSENGER LOCOMOTIVE.

For the Bound Brook Line of the Philadelphia & Reading Railroad, between New York and Philadelphia. Built by the Baldwin Locomotive Works, Philadelphia, Pa.



tween a steam cylinder and a man with a hammer. He did not think that this button-set process could upset the metal within the hole as hand riveting did. There was also a contraction by cooling while the hammering was going on.

Mr. HAYES said that he had not adopted the button-set riveting because the boiler-makers were opposed to it. Mr. SETCHEL thought that an argument in its favor.

Mr. SIMMONS believed in steam riveting. One heavier blow was better than many lighter ones. In hand riveting the rivet got cold, and you strained the iron by hammering.

The discussion was then closed and the next question taken up. It was as to the

#### BEST METHOD OF ANNEALING STEEL SHEETS AFTER FLANGING.

Mr. HAYES said that many thought that in annealing the sheet after flanging it was apt to spring.

Mr. ORTON said that annealing the steel sheets was absolutely necessary. In his experience he had found that it should be done with a wood fire, never with coal. He had seen sheets crack entirely from want of proper annealing.

Mr. SEDGLEY said that he annealed all sheets after flanging. He used a furnace with a frame or bed of old rails, and in all cases used a light wood fire.

Mr. BOON said that to anneal sheets you must have a proper furnace. He had found that furnaces using reflected heat were the best, being free from gases.

Mr. WOODCOCK said that he annealed all steel sheets after flanging, and had never had any trouble from sheets springing.

Mr. SETCHEL inquired what the practice was in the locomotive shops.

Mr. SPRAGUE said that they did not anneal very much. They rarely had trouble from sheets cracking in service. He had given no attention to annealing furnaces, and had not seen any necessity for it.

The discussion was then closed.

Mr. RAYMOND then read an argument in favor of giving standing committees the right to make inquiries of members, and to impose fines upon those failing to answer.

Mr. SETCHEL thought that the imposing of fines would not benefit the Association, but would be injurious.

Mr. SPRAGUE proposed that each associate member be required to read a paper before the Association once in five years.

Mr. ORTON believed that the questions put by committees should be more generally answered, but was opposed to fining members. He thought the plan adopted by the Master Car-Builders for two years past a very good one. They appointed a committee to find out what would be desirable to bring before the convention, and authorized them to take what means they saw fit to get the desired information.

Mr. LAUDER realized the importance of taking a new departure in securing information. Members should answer committee questions promptly in order to give committees time to consider and prepare their reports, and so the reports could be submitted in time for proper consideration by the Association. As to associate members, he thought that each one should be asked to contribute a paper once in three years. They were certainly qualified to present papers which would be an honor to the Association and add much interest to its proceedings.

Mr. RAYMOND said that he was willing to accept the requirement, and would be ready to fulfill his part at the present meeting.

The resolution to refer Mr. Raymond's paper to a special committee to consider the methods of committees appointed to secure information, and present subjects for discussion, was adopted.

The President appointed as the committee, Messrs. Raymond, Orton, Woodcock, Boon, Forney, Kaufholz and Hodgman.

The report of the Finance Committee was then presented, read and received.

The report of the Committee on the Best Method of the Prevention of Smoke from Locomotive Boilers was then read (published on page 259).

The Association then adjourned until the next day.

(TO BE CONTINUED.)

#### Fast Passenger Locomotive.

In the *Railroad Gazette* of May 7, we published perspective views of the locomotive built by the Baldwin Locomotive Works to run the fast trains between Philadelphia & New York over the Bound Brook Line. This week we give a side elevation and sectional views, which show some interesting points in the construction of this engine and which will interest many readers.

From the sectional view of the cylinder in fig. 1 it will be seen that Allen valves were used in this engine. Fig. 3 shows the form of the fire-box and the method of staying it.

In fig. 1 the apparatus for increasing or diminishing the weight on the driving-wheel is shown. The fulcrum of the equalizing lever is shown on the left of the driving-wheel outside of its tire. It will be seen that this fulcrum works in a slotted hole. The cylinder by which the apparatus for changing the load is operated is shown between the spokes of the driving-wheel to the left of its vertical centre line and above the horizontal one. The piston-rod works through the lower head of the cylinder, and is connected by a slotted hole and pin to an arm of a transverse shaft shown in dotted lines. The arm stands at an angle of about 45 degrees in the engraving. On this transverse shaft is a cam on each side, also shown in dotted lines. When steam is admitted to the cylinder the arm is depressed and the cams are then brought into contact with the levers, and the weight is then carried on these cams. Being nearer to the driving-wheels than the other fulcrums, a larger proportion of the weight is brought on these wheels when the weight rests on the cams than when it is carried on the other points, and by means of the cylinder the weight can, of course, be shifted when it may be desirable to do so.

This plan has been patented by Mr. Wm. P. Henszey. In his patent specification he says:

"The two fulcrums of the beams must be under the control of the engineer, who must be able to change their positions by an appropriate system of levers and rods or other appliances; or the fulcrums may be operated by the aid of a small steam cylinder, the value of which must be controllable by the engineer, who can, by changing the position of the fulcrums, impart a greater weight to the driving-wheels

on starting the engine and train, and after the latter is running can transfer the excess of weight to the trailing-wheels, so that the latter and the driving-wheels will sustain the same weight."

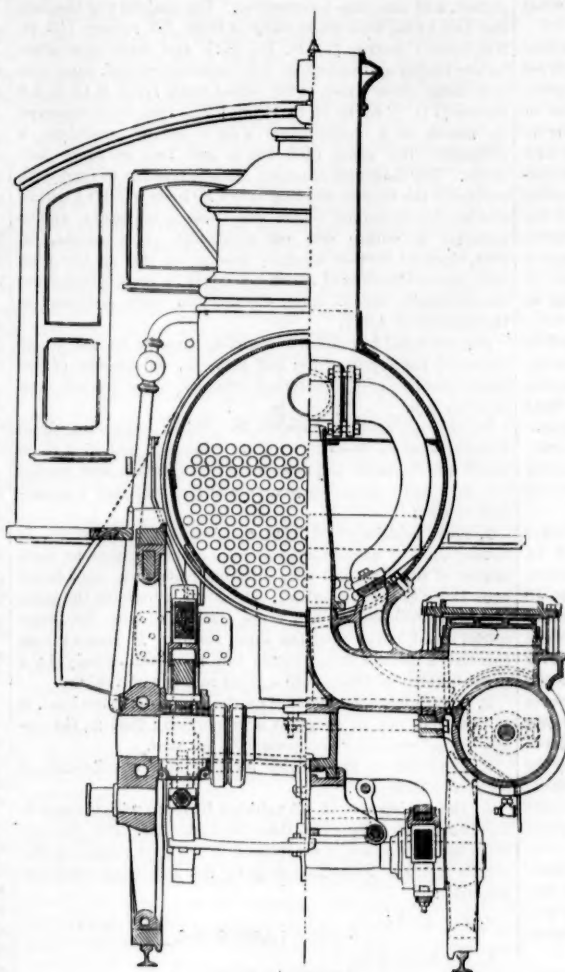


Fig. 2.

Half Transverse Section through Driving-Wheel. Half Transverse Section through Cylinder.

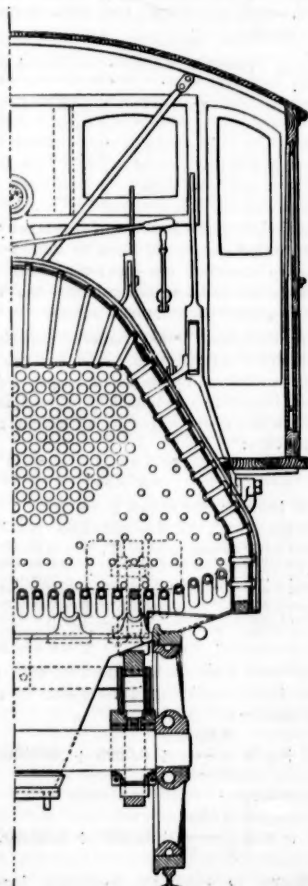


Fig. 3.—Half Transverse Section through Fire-Box.

#### Contributions.

##### Train Resistance on Railroad Curves.

BY BARON M. M. VON WEBER.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Perhaps the most important, and certainly one of the most

important, of the problems in the realm of the technics of railroad operations is that of the resistance met by railroad trains while running on curves.

This not only affects the location and the construction of railroads, but, through the effect which it exercises on their "effective length" and the working expenses which stand in direct connection thereto, also the amount of operating expenses, and so, indirectly it is true but in a most effective manner, the rates charged, if these latter have a rational basis.

The railroad engineers of all countries, therefore, have turned their attention to this problem and recognized its great importance.

Nevertheless, until recently its solution, in comparison with the importance of the matter, has been sought with too little effort.

This otherwise not easily intelligible course is explained to a great degree by the unusually great difficulties which stand in the way of ascertaining the resistance of curves in a manner which will really answer practical requirements.

Such an ascertainment evidently could only be had by experimental methods, and therefore the difficulties connected with it were double—financial as well as technical.

Experiments carried far enough and made with suitable appliances must be costly, their conduct in sufficient number and in a sufficiently long series must require the application of technical ability for a long time and the special construction of apparatus to be used therein.

The complexity and number of the facts to be established by the experiments, if the problem was to really and practically be solved, was very great.

To name beforehand but a few of these facts, there were resistances of very various kinds to be ascertained. Of these, the following are perhaps the most important:

1. Those which one and the same vehicle experiences in its movements on curves of different radii.
2. Those of vehicles of various construction on curves of various radii—with permanent wheel-bases of different dimensions; with adjustable axles of different constructions; with radial axles, likewise of different constructions; with pivoted trucks, etc.
3. Those of one and the same vehicle on curves of the same radius, with different speeds, within customary limits.
4. Those of the same vehicle on the same curves at the speeds before applied, but with differing super-elevations of the rails and differing concities of the wheels.
5. Those of vehicles connected in longer or shorter trains.
6. Those of the longer or shorter trains, according as they are drawn or pushed by the locomotives.
7. Those of the cars and trains with relation to the effect of the condition of the track as caused by atmospheric influences, etc.

The number of the experiments requisite for the combination of these conditions, which would be necessary to establish the main elements only, amounts to thousands.

If, now, we take into consideration what masses are to be set in motion, what distances the vehicles have to pass over, what manual and intellectual forces have to be applied, in order to complete a single experiment of this kind when tried under favorable circumstances, then we perceive immediately the enormous expenditure of time, labor and patience which trials of this kind must require. The successful experiments, however, are the least common by far. The springing up of a wind, a change in the direction of the atmospheric current, the occurrence of a light rain, a depression or displacement of the track, the stiffening of the lubricating material on the cars by the falling of the temperature a slight injury to any of the vehicles, an oversight in starting, and thousands of other accidents, often make experiments useless which have otherwise been without fault. When the atmospheric conditions happen to be favorable for making the experiments, it seldom happens that the great provision of men, locomotives, cars and instruments is on the spot and ready for service; and when finally everything has been obtained and made ready, in many cases the weather has changed.

In spite of all these hindrances and difficulties, these questions must be solved, if we would not have a gap in our knowledge of the properties of railroad appliances, on account of which the use of them in many of their most important relations is reduced to an uncertain, empirical groping in the dark.

German technical education being what it is, there could not fail to be many attempts to solve the problem by purely speculative and theoretic methods, even without a sufficient experimental basis.

To these efforts we owe a number of very learned works, the products of great industry, and as results of analytical science very meritorious. Unfortunately the problem was not advanced a single step toward a really practically useful solution by all this expenditure of acuteness and learning.

The apparatus to be recommended for making experiments which promised the attainment of applicable results, and in fact the only apparatus in question, was seen to be the inclined plane terminating in a curve. At first glance nothing seems simpler than to run cars to portions of roads where straight inclined sections of track terminate in curves of different radii, to let the cars run down these sections, and to observe the phenomena that occur thereupon in a suitable manner. Easy as this seems, the practical man immediately perceives how difficult it is. While running to such







ing their so-called earnings by charges for work of this kind.

We do not know where or with whom the practice first originated. We know, however, that while the custom is not general it prevails upon widely separated roads, and that its advocates are sufficiently high in authority to have secured its adoption and incorporation into the regulation of affairs of many important and well managed lines.\* Thus the very conservative Railway Commissioners of Massachusetts, an authority to which we notice the Railway Commissioners of other states defer in many things connected with the affairs of railroad companies, direct that:

"All fuel, material (except gravel) and supplies hauled for company's use should be credited to freight earnings at fourth-class rates, charged to the proper accounts, and included in the freight tonnage."<sup>4</sup>

A practice having the encouragement and direction of men so high in office, and fraught, as this is, with such great importance to the railway companies, is worthy of careful consideration; we can, however, notice only its more salient features here.

#### THE EFFECT OF THIS PRACTICE.

The practical effect, in the first place, of the custom, as every one can see, is to enormously increase the earnings account of railroads, and to enhance, nominally, the price of every species of material (except, in the case of Massachusetts, gravel) used by them.

The rate that is charged for transporting is incorporated at once with the ordinary freight receipts of the line, and added to the original cost of the supplies on hand.

When the material is finally used, the first cost, with the local earnings added, is charged to whatever account the material is expended upon, but until the material is actually used, the earnings upon it, with the first cost, appear in the accounts as an asset, so that the first effect of a company's charging for the transportation of its own material is to swell its apparent income, and at the same time increase its assets by the amount of the local earnings on such material.

Eventually the Operating Expense and other disbursement accounts will of course be charged with such local earnings, and thus the gain to Income is set off by a counter-charge, but the charge, unfortunately, does not appear in the accounts simultaneously with the gain. On the contrary, it appears temporarily as a valuable asset, and as a company must always keep on hand a large quantity of material, it follows that its assets will be permanently enhanced by the amount of the accumulated earnings on its own traffic. The assets of a company will thus depend upon the amount of supplies it keeps in store and the distance they have been hauled and the rate that has been charged by the owner for such service.

If the earnings of a company are increased by the addition of the charges on its own traffic, it is of course necessary to swell the tonnage by the accumulated weight of such traffic. The effect of this is, apparently, to greatly magnify the commercial operations of a road. But (in the case of Massachusetts, noticed above) as the rate at which the material is carried is fixed arbitrarily at a very low price, it lessens in the accounts and returns the average rate which a company apparently receives for doing its business, and thus serves to mislead the student in his examination of the published accounts of the railroad companies.

If the practice of charging for the transportation of material were followed universally, it would be a well understood factor in the affairs of railroads, and the harm would be lessened somewhat, perhaps, but until the system is adopted upon every road it would seem to be only just to investors and the public that those companies having what we may call an Operating Traffic Account should state the amount of such traffic earnings, and the tonnage upon which it is based, specifically in their books and returns. And we are not sure that such a separation of the accounts would not be well in any event, even if the practice of charging for the transportation of supplies should become universal.

Other objectionable features of a very serious character connected with the practice of charging for transporting the material of a railway company suggest themselves.

The opening of an Operating Traffic Account will add greatly to the cost of accounting; it will increase the bulk and add greatly to the labor.

The details will be magnified indefinitely. Thus the material must first be weighed, a bill made, and the charges duly extended thereon. When the material reaches its destination, the charges will not be paid to station agents in cash, as is the case with ordinary commercial business, and so end there. No. Before the accounts of the agents can be relieved of the burden of these myriad operating charges, each transaction and item must be formally examined by the proper accounting officers, and specific vouchers must be duly certified and approved and passed through the books of the different departments. Further than this, the earnings upon each item of material must be carefully and systematically followed up and recorded by the accountant at headquarters, and by the clerks at the various shops, store-houses and depots of supplies, so that the charge may be disposed of when the material it affects is finally consumed, and not before.

All this involves infinite minutiae. It increases the force, and thereby increases the expense of doing business. The machinery required to perform the labor effectually must be both elaborate and costly. Any neglect to perform the work thoroughly and systematically cannot but result to

the company interested in grave irregularities and loss of esprit.

Still other objections to the system suggest themselves. If the practice is to be incorporated in our railway system, it is clear that a fixed rate should not be charged for all classes of material. We know that the cost of handling and transporting warehouse trucks, wheel-barrows, office chairs, ticket-cases, glass and kindred articles is much greater per hundred weight than for fuel, iron rails, ties and pig metal. The work is also much greater. The rate charged should consequently be higher. Clearly the charge, if any charge is to be made by a company for transporting its own supplies, should be based upon the ordinary traffic tariffs in use.

These tariffs are the product of men skilled in all the varying phases which the subject of transportation presents. Although crude in many respects, they exhibit infinite skill and are the result of many years of acute observation and thought. While the transportation problem is a science which is but imperfectly understood, and still more imperfectly expressed, still we are sufficiently versed in its mysteries to know that an arbitrary rate for all classes of business, without reference to the cost engendered, cannot be accepted as satisfactory. Such a disposition of the question would not be creditable, no matter under what circumstances it might be applied.

Again, if it is right to charge for the wood, coal, stone, ties, iron, fencing and other material of a railroad company, why should gravel or ballast be excepted, as required by the Massachusetts regulations? Ballast is an indispensable article in railway economy, and one of the most important. It is as much a necessity as fuel, the rails upon which the cars move, or the ties that render it possible to preserve a uniform track. Surely so important an addition to the operating traffic account should not be thrust aside in such a manner. We cannot leave this subject without submitting the propriety of this discrimination to the further consideration of the advocates of an "Operating Traffic Account."

A charge for material and gravel at fourth-class rates would double, nay quadruple, the earnings of many important lines.

But whatever the increase of the earnings account may be from the practice of charging for the transportation of material, the apparent gain would be more than counterbalanced by the increase of the expense account over and above the amount of the so-called earnings, as the cost of accounting, which the system involves, as we have explained above, would have to be added. The practice would also have the effect to destroy the relation which the operating expenses naturally bear to the earnings. Upon all supplies transported the operating expense would be the same as the gross earnings accruing from that source, or one hundred per centum.\*

Instead of discovering an advantage from the adoption of the system of charging freight on a company's supplies, we discover therefore a positive loss, equal in amount, at least to the cost of accounting and the expenses incident thereto.

The subject is prolific of suggestions. If it is right for a company to charge for transporting material intended for its own use, then it seems to me clearly to follow that it is right for it to charge for the carriage of every employé it transports. It would not only be right but necessary and proper that it should do so. I do not see how this conclusion can be questioned. The employé manipulates the supplies and renders them available; without his services they would be valueless. Hence the principles of accounting applicable to them apply equally to him.

The suggested charge for transporting material is made, it is presumed, primarily for the purpose of ascertaining the approximate cost of such material at the point where it is used, and, per consequence, the cost of the work upon which it is expended.

But why stop with material? To make the information of value, we must also know the cost of transporting the operatives. We cannot make comparisons otherwise, and without it the system would be incomplete and fragmentary.

Without this information we are only partially enlightened; we must know all the facts, otherwise the system falls to the ground. We must know, for instance, the cost of the manager's tour of examination, and each item of work must be charged with the thought he devotes to it; we must know the cost of transferring employés from one part of the line to another; the peregrinations of inspectors, auditors, trackmasters and the myriads of officials, agents and others that swarm up on the line in pursuit of their daily business. The passenger earnings must be increased by charging for the transportation of all these people at ordinary traffic rates. It may be said, indeed, by the shallow-minded, that a company is put to no great expense on account of this service, as no additional cars are hauled to afford it accommodation; but this is a superficial view of the subject, and utterly unworthy our serious attention.

The earnings from the transportation of employés would, it is apparent, greatly increase and round out the lean proportions of the passenger receipts, and the information would prove quite as valuable in ascertaining the cost of the various departments and branches of railway service as the ascertainment of the cost of moving the supplies of a company.

The cost of keeping accurate and trustworthy accounts of the movements of operatives and the debits and credits re-

sulting therefrom would, to be sure, add greatly to the expense of a railway company, but not greater, relatively, than the cost of keeping accurate account of the receipts from material carried. Upon many lines the work of keeping these accounts would be sufficient to merit the formation of a separate bureau of accounts. If consolidated with the business that would arise from the practice of making a charge for carrying railway supplies, it would warrant the construction of a separate department. The nominal product of this department (its receipts and expenditures) would, we doubt not, outrank that of all others. But we may be certain that its expenditures would exceed its so-called receipts.

#### THE DECEPTIVE EFFECT ON REPORTS OF EARNINGS.

Under a system of charging for supplies and operatives transported, the earnings of our roads would no longer rest upon the cash collections; they would depend upon the quality of a company's material, its durability, where it was purchased, the industry and enterprise exercised in moving its supplies from point to point, the number of its servants, and, finally, the celerity with which the latter traveled from place to place. It would only be necessary when times were dull and traffic receipts light, or when it was desirable for any purpose to exhibit large earnings, to load half-a-dozen or more trains with operatives or supplies and haul them such distance as might be required to produce the desired effect or make up the amount of earnings needed.

We commend this phase of the subject to the consideration of companies owning uncompleted roads or roads running through unproductive districts of country. The subject also merits the attention of receivers acting under the order of our courts, who get for their services a percentage of the nominal income of the property they manage—or mismanage, as the case may be.

Aside from the cost engendered, the fictitious elements which the practice of charging for the transportation of supplies and operatives injects into the life of a railroad render it highly objectionable. The exhibits no longer convey a trustworthy account of the profitable traffic of a company; the percentage that its expenses bear to its earnings is greatly increased, and we are ever in doubt as to how much of the apparent prosperity is fictitious, how much real. Our examination of the returns of a railway company thus made would much resemble our examinations of the planet Jupiter; we should be forever striving to ascertain how much was solid, how much gaseous.

In many of the states the taxes levied upon the railroad companies are based upon the gross earnings of the latter. If the companies charge for the transportation of their own supplies and men would be they compelled to pay a tax upon the amount of the revenue credited as accruing from this source, or would they go through their accounts item by item and carefully eliminate such charges before making their returns? Clearly the latter process would be attended with considerable expense and would be likely to overlook many items that ought properly to be deducted. However, the policy of paying a tax upon fictitious earnings would, we know, be still more objectionable to the railroad companies than the expense and inconveniences (with the resulting inaccuracies) of eliminating such earnings from the returns upon which their taxes are based.

In this connection a curious inquiry suggests itself. After the Massachusetts Railroad Commissioners, through their Supervisor, had directed each railroad company in the state to include in its earnings a charge at fourth-class rates on all material and fuel, save ballast, transported for its own use, their chairman recommended that the taxes on railroads shall be based upon their earnings. The effect of this is, as already explained, to levy a tax on the so-called earnings of the companies derived from the transportation of their own material;† or is it the intention of Mr. Adams to except the so-called earnings on railway supplies from the operations of the tax. If so, the exception, it seems to me, should clearly be recommended with the suggestion which he makes to alter the method of taxation.

I cannot stop to enumerate in detail the number and serious character of the objections that present themselves to my mind in connection with the practice of compelling railroads to include in their earnings fictitious credits for supplies and operatives transported by them in connection with their ordinary works. I have said enough, however, I trust, to cause those disposed to insist upon the adoption of the practice to pause and consider whether it is either politic or wise for them to ask the railroad companies to swell their accounts with hypothetical receipts and charges of this nature.

#### EARNINGS SHOULD BE CHARGED ON CONSTRUCTION MATERIAL.

The objections, however, that may be offered to the practice of charging for material and men transported in connection with the incidental operations of a company do not, I think, hold good in connection with its construction work.

In the prosecution of new lines and extensions, in the construction of new works, in the addition of equipment, and in such other improvements as come properly under the head of permanent expenditures, it is important that the whole cost should be ascertained. Hence it is not only proper but right and necessary that construction should be charged for all material and men transported in connection with such work.

The operating expenses of a road are temporary and evanescent, but the construction account represents a

\* "It is not the general custom for a road to charge freight over its own lines upon material or fuel which is to be used in operating the road, though occasionally one comes across a road that does this. I think, however, that the principle is wrong."—Letter from General Auditor, Mr. John P. Whitehead.

† Eighth Annual Report of Massachusetts Board of Railroad Commissioners, p. 87.

\* "Unlike other operating expenses, which vary all the time in proportion to the earnings with which such expenses are connected, a charge for transporting a company's supplies would permanently and always amount to 100 per cent. on the corresponding amount included in the earnings, and the effect would be to raise the total percentage of the operating expenses, as a whole, to the total earnings. The extent of such advance would, of course, depend upon the extent to which the expenses were increased by including such freight."—Communication of General Auditor John P. Whitehead, Esq.

\* Mr. Charles Francis Adams, Jr.—*Proceedings of National Conventions of Railroad Commissioners*, p. 18.

† This would increase enormously the taxes of the railroads, as at present levied in Michigan, Wisconsin, Minnesota, wherever, in fact, the tax is based on gross earnings.



permanent investment. Upon the total amount of this investment the owners are entitled to a reasonable return, no matter when or how, or for what purpose the amount was advanced; hence the necessity of the charge against this account being full and accurate.

Other reasons, not necessary to enumerate here, suggest themselves why it is desirable that the exact cost of construction work should be accurately ascertained.

However, each company should be left free to act its own pleasure in this as in other matters of a similar nature. In view of all the facts surrounding the subject of an operating traffic account, some of the more objectionable features of which I have pointed out, I would suggest the incorporation of a rule like the following in the regulations of all railway companies, in place of that submitted by our Massachusetts friends, to wit: The employees of a company and all material and fuel owned by it, used in the ordinary operations of its road, shall be carried without charge upon its books or in its accounts, but for all men and material transported by it for construction purposes a charge may, at its option, be made at the usual traffic rates.

#### American Production of Iron and Steel Rails in 1879.

The following is extracted from the annual report of the Secretary of the American Iron and Steel Association, Mr. James M. Swank, who has collected the statistics of the American iron trade, with very great care, and presented them in this report very fully and completely.

The production of rails of all kinds in the United States in 1879 was the largest in the history of the country, amounting to 1,113,273 net tons, or 993,993 gross tons. The largest production previous to 1879 was in 1872, when 1,000,000 net tons, or 892,858 gross tons were made.

The rail product of 1879 was composed of 683,964 net tons of Bessemer steel rails, 420,160 tons of iron rails, and 9,149 tons of open-hearth rails. The total production in 1879 was 230,588 tons greater than in 1878. That of Bessemer steel rails was 133,566 tons greater, and that of iron rails was 97,270 tons greater; but there was a decrease in 1879 of 348 tons in the production of open-hearth steel rails as compared with 1878.

The production of street rails in 1879 is included in the aggregate production for the year, and amounted to 8,643 tons, of which 5,813 tons were Bessemer and open-hearth steel rails, and the remainder were iron rails. The production of street rails in the six preceding years was as follows: 1873, 9,430 net tons; 1874, 8,739 tons, of which 1,000 tons were Bessemer steel; 1875, 16,340 tons, of which 2,308 tons were Bessemer steel; 1876, 13,686 tons, of which 3,563 tons were Bessemer steel; 1877, 7,015 tons, of which 1,269 tons were Bessemer steel; 1878, 9,229 tons, of which 1,710 tons were Bessemer and open-hearth steel.

The production of iron and steel rails in this country, since the beginning of the manufacture of Bessemer steel rails has been as follows, in net tons:

Years.	Open-hearth steel rails.	Iron rails, all kinds.	Bessemer steel rails.	Total.
1867.....	459,558	2,550	462,108	
1868.....	499,489	7,225	506,714	
1869.....	583,936	9,650	593,586	
1870.....	580,000	34,000	620,000	
1871.....	737,483	38,250	775,733	
1872.....	905,930	94,070	1,000,000	
1873.....	761,062	129,015	890,077	
1874.....	584,469	144,944	729,413	
1875.....	501,649	290,863	792,512	
1876.....	467,168	412,461	879,629	
1877.....	332,540	432,169	764,709	
1878.....	9,397	322,890	550,308	882,685
1879.....	9,149	420,160	683,964	1,113,273

Included in the column of iron rails are a few tons of crucible steel rails and steel-headed rails, which it has not been thought necessary to separately classify. No crucible rails have been made since 1874, and but a few tons in that or any preceding year. The production of both the classes of rails mentioned was as follows in 1873 and 1874: 1873, 26,977 net tons; 1874, 17,181 tons. The production of steel-headed rails in the last five years has been as follows: 1875, 19,436 tons; 1876, 12,791 tons; 1877, 5,844 tons; 1878, 2,288 tons; 1879, 9,831 tons. The Elmira Iron and Steel Rolling-Mill Company, at Elmira, N. Y., made all the steel-headed rails that were made in 1879, using "silicon tops."

The production of rails of all kinds in the United States from 1849 to 1879 has been as follows, in net tons:

Years.	Net tons.	Years.	Net tons.
1849.....	24,518	1865.....	356,292
1850.....	44,083	1866.....	430,778
1851.....	50,603	1867.....	462,108
1852.....	62,478	1868.....	506,714
1853.....	87,764	1869.....	593,586
1854.....	108,016	1870.....	620,000
1855.....	138,074	1871.....	775,733
1856.....	180,018	1872.....	1,000,000
1857.....	161,918	1873.....	890,077
1858.....	169,712	1874.....	729,413
1859.....	193,454	1875.....	792,512
1860.....	205,038	1876.....	879,629
1861.....	189,818	1877.....	764,709
1862.....	213,942	1878.....	882,685
1863.....	275,768	1879.....	1,113,273
1864.....	335,369		

The following table shows the production in net tons of rails of all kinds in the United States from 1876 to 1879 by States:

STATES.	1876.	1877.	1878.	1879.
Pennsylvania.....	353,925	347,968	406,206	498,336
Illinois.....	181,490	130,762	196,538	265,300
Ohio.....	100,799	82,270	87,520	109,386
New York.....	57,306	34,094	54,471	78,634
Wisconsin.....	21,280	21,439	28,960	30,890
Indiana.....	29,383	34,876	28,000	30,679
Kentucky.....	1,524	12,100	13,000	25,414
Tennessee.....	21,334	11,373	9,479	15,185
Georgia.....	30,000	10,031	8,345	11,250
Kansas.....	14,707	16,018	12,685	10,208
Wyoming Ter.....	12,239	10,007	10,425	9,656
Massachusetts.....	9,061	9,640	7,965	7,725
California.....	8,629	5,750	6,779	6,930
Vermont.....	9,183	3,899	2,500	4,974
West Virginia.....	538	1,756	1,230	3,277
Colorado.....			1,900	2,500
Maryland.....	18,844	8,531	3,900	2,393
Maine.....	7,500	2,526	3,022	321
Missouri.....	30,903	31,289	362	
New Jersey.....	243	380	8	
Michigan.....	1,600			
Totals.....	879,629	764,709	882,685	1,113,273

It will be seen that 17 states and one territory made rails in 1879. Pennsylvania's production of 498,336 net tons in 1879 was the largest in her history. In 1875 her percentage of the total production of the year was 32.19; in 1876 it was 40.24; in 1877 it was 45.50; in 1878 it was 46; in 1879 it was 44.76. The production of 285,300 net tons in 1879 by Illinois was not only the largest in her history, but also the largest ever reached by any state except Pennsylvania. It was 23.83 per cent. of the total production of the country. The other states which made more than 1 per cent. of the total production of rails in 1879 were as follows: Ohio, 9.82; New York, 7.06; Wisconsin and Indiana, each 2.77; Kentucky, 2.28; Tennessee, 1.36; Georgia, 1.01.

In 1849 the entire production of rails in the United States was 24,518 net tons. In 1879 the far Western states of Kansas, Colorado and California, and the territory of Wyoming exceeded this product by 4,982 tons. Their production was as follows: Kansas, 10,208 tons; Colorado, 2,500 tons; California, 6,936 tons; Wyoming, 9,656 tons. In 1879 Illinois alone made more rails than the whole country made in any year prior to 1863.

#### CONSUMPTION OF IRON AND STEEL RAILS.

The following table will show approximately the consumption of rails in this country from 1867 to 1879, in net tons:

CALENDAR YEARS.	Made in United States.	Imported.	A p p r o x i m a t e consumption.
1867.....	462,108	163,049	625,157
1868.....	506,714	250,481	756,795
1869.....	593,586	313,163	906,749
1870.....	620,000	399,153	1,019,153
1871.....	775,733	515,000	1,341,434
1872.....	1,000,000	381,064	1,530,850
1873.....	890,077	140,786	1,448,849
1874.....	729,413	99,201	1,148,849
1875.....	792,512	7,706	837,724
1876.....	879,629	100,515	810,770
1877.....	764,709	1,942	870,916
1878.....	882,685	1,042	764,744
1879.....	1,113,273	35	882,695
		19,090	1,157,420
		25,037	

We may here remark that we regard the claim that 1,500,000 gross tons of rails will be required by the new and old railroads of the country in 1880, and that American works cannot meet this requirement, as unwarranted by past experience and existing probabilities. It is true that in 1872 we required about 1,366,830 gross tons (1,530,850 net tons), but since the close of that year we have laid over 2,000,000 gross tons of steel rails, the superior wearing qualities of which must be considered in estimating the probable quantity of rails to be required this year for renewals of existing tracks, while the mileage of new roads to be finished in 1880 is not likely to greatly exceed the average of the three years, 1870, 1871 and 1872, which was 8,466 miles. Hence it is not probable that we will require as many rails in 1880 as in 1872, and those that are required can all be made by American works. We produced in 1879 the astonishingly large quantity of 993,993 gross tons of rails, with a number of rail mills standing idle which have since been put in operation. With the additional facilities for production that have since been completed or undertaken, the country's capacity for the production of rails will this year be equal to all demands, but these demands will fall short of 1,500,000 gross tons.

#### PRICES OF IRON AND STEEL RAILS IN 1879 AND 1880.

The average yearly prices at which iron rails have been sold in this country during the past nine years are given below, the quotations being for best iron rails at Philadelphia per gross ton:

Year.	Price.	Year.	Price.
1871.....	\$70.37 1/2	1876.....	\$41.25
1872.....	85.12 1/2	1877.....	35.25
1873.....	76.09 1/2	1878.....	33.75
1874.....	58.75	1879.....	41.25
1875.....	47.75		

The lowest quoted price at which iron rails have ever been sold in this country was \$31.50 a ton, in October, 1877. From that time until April, 1879, there was a steady advance to \$35.50, and from April until the close of the year there was a rapid advance to \$54. In January of this year there was a sudden jump to \$65, and in February sales were made at \$68. Since February the price has fallen to \$50 at the middle of May.

The average yearly prices at which Bessemer steel rails have been sold in this country since 1868 are as follows, per gross ton, the figures given being the prices at the works in Pennsylvania:

Year.	Price.	Year.	Price.
1868.....	\$158.50	1874.....	\$94.25
1869.....	132.25	1875.....	68.75
1870.....	106.75	1876.....	59.25
1871.....	102.50	1877.....	45.50
1872.....	112.00	1878.....	42.25
1873.....	120.50	1879.....	48.25

The lowest quoted price at which Bessemer steel rails have ever been sold in this country was \$40 a ton, in November and December, 1877. From this price there was a gradual advance to \$43.50, in May, 1878; but this price was not maintained throughout the year, sales being made in December at \$41. But from this time forward the price steadily advanced until September, 1879, when it touched \$50. From September, 1879, to February, 1880, there was a rapid advance to \$85, from which price there has since been an equally rapid decline to \$65 at the middle of May.

#### ANNUAL REPORTS.

##### Wisconsin Central.

This company owns a line from Stevens Point, Wis., to Ashland, on Lake Superior, 250 miles, with branches from Stevens Point to Portage, 70 miles, and from Menasha to Appleton, 5 miles, making 325 miles owned; it leases the Milwaukee & Northern, from Milwaukee to Stevens Point, 102 miles, with a branch from Hilbert to Green Bay, 27 miles, making 129 miles leased and 454 worked. The Milwaukee & Northern lease includes 9 miles of the Chicago, Milwaukee & St. Paul track out of Milwaukee. The road is worked by trustees for the bondholders pending the completion of an agreement for reorganization. The report is for the year ending Dec. 31.

The equipment consists of 25 engines; 13 passenger, 4 sleeping and 6 baggage cars; 627 freight and 10 caboose cars; 3 business and pay cars, and 40 gravel cars.

The stock and bonds are as follows:

Preferred stock.....	\$2,000,000
Common stock.....	9,435,500
Total stock (\$35.185 per mile).....	\$11,435,500
Bonds (\$25.132 per mile).....	8,168,000
Total.....	\$19,603,500

The bonds are now in process of exchange for new securities under the reorganization agreement, which is intended to preserve the stockholders' interest in the property, while recognizing fully the rights of the bondholders.

The traffic for the year was as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Train mileage.....	167,083	153,259	I.	13,824 9.0
Passengers carried.....	6,385,319	5,661,975	I.	723,344 12.8
Passenger mileage.....	325,078	244,976	I.	80,102 32.7
Tons freight carried.....	30,921,076	23,225,583	I.	7,695,493 33.1
Tonnage mileage.....				
Av. rate:				
Per pass. per mile.....	3.32 cts.	3.44 cts.	D.	0.12 ct. 3.5
Per ton per mile.....	1.93 "	2.14 "	D.	0.21 " 9.8

The chief item of freight was lumber. The traffic showed a large increase, with a slight falling off in rates of both passenger and freight. The business of the road is growing steadily.

The earnings for the year were as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Passage.....	\$212,191.63	\$194,560.69	I.	\$17,630.94 9.1
Freight.....	506,544.42	496,017.85	I.	100,526.57 20.3
Mail, express, etc.....	42,314.94	43,240.76	D.	885.82 2.1
Total.....	\$851,050.99	\$733,819.30	I.	\$117,231.69 16.0
Expenses.....	497,138.75	474,497.01	I.	\$22,641.74 4.8
Net earnings.....	\$353,912.24	\$259,322.29	I.	\$94,589.95 36.5
Gross earn. per mile.....	1.874.65	1.616.32	I.	258.33 16.0
Net earn. per mile.....	779.63	571.19	I.	208.44 36.5
Per cent. of exps.....	58.41	64.66	D.	6.25 9.7

The earnings show a very considerable increase, both gross and net. The payments reported are as follows:

Net earnings as above.....	\$353,912.24
Rentals paid.....	100,861.05
Net surplus.....	\$193,050.59

This net surplus was 2.36 per cent. upon the bonded debt. The surplus in 1878 was \$122,563.68. During the year the sum of \$50,995.83 was expended on construction and equipment account, the largest item being \$13,643.73 for new cars.

The President's report says of the progress of the reorganization:

"The trustees, in accordance with your votes and the votes of your directors, carefully preserve and hold each old bond uncanceled as against the company, until all the old bonds have been exchanged for the new securities. The new consolidated mortgage is dated Jan. 1, 1879, and was executed to Messrs. Stewart and Abbot, and acknowledged on June 13, 1879, and was recorded by order of the trustees in the office of the Secretary of State, on Oct. 7, 1879. They then signed the new bonds, and began the issue of the new securities, which were all placed in their hands for this purpose. No single bondholder has been able to secure any preference or advantage over his associates; and, until the exchange is entirely accomplished, the property is managed by the trustees, in accordance with the terms of their trust, in substantially the same manner as if the reorganization were technically completed. All active opposition to this course of proceeding has ceased. The single individual who endeavored to interfere with the action of the trustees, and tried to procure their injunction and removal, was signally defeated in the courts, and is now said to have sold his bonds. He has certainly retired from the contest, without any advantage gained therefrom, and without any inducement given to lead him to withdraw. Considerable time may elapse before all the small lots come in; but the delay is of no practical importance."

The Land Department reports sales in 1879 of 10,526 acres; total sales to end of 1879 were 76,734 acres. The total receipts were for land sold, \$203,489; town lots, \$17,608; stumpage on timber lands, \$179,056; total, \$400,213. The amount of land contracts on hand is \$31,164.

The report of Mr. Charles L. Colby, Agent, to Messrs. John A. Stewart and Edwin H. Abbot, Trustees in possession, contains the following:

"The increasing of our local business has occupied much attention. Many projects intended to augment both passenger and freight traffic have been successfully carried out. The reports of the General Manager and Auditor show a marked increase in earnings over the corresponding months of the year 1878. Several new mills have been built on our line. Better arrangements with connecting roads for obtaining cheap communication with the lumber markets have stimulated this traffic, and its consequent increase has obliged a large addition to our rolling stock. This demand has been supplied by the Central Car Company, an organization formed by our stockholders for this purpose, from which we have obtained, and are obtaining, additional rolling stock and motive power on favorable terms."

"Our employees are all promptly paid. The floating debt on pay-rolls and for supplies, which rested on the property a year ago, is all extinguished. All extra demands, such as accounts for construction, legal services, expenses of reorganization and the like, are promptly met."

"The first instalment of interest which matured under the reorganization on March 1, 1880, upon the preferred indebtedness, was punctually paid, and the receipts from the operating department show an increasing surplus over the expenses."

"Among the projects for enhancing the value of the Wisconsin Central Railroad, none are of more importance than the building of the Wisconsin & Minnesota Railroad from Abbotsford, on our line, west to Chippewa Falls. The construction of this railroad is vigorously pushed, and it is expected to be finished and ready for business some time during the coming fall."

"The Northern Pacific Railroad Company is now working on the extension of their line across from their eastern terminus to connect with our road at Ashland. Their engineers are now locating the line, and it is expected that construction will begin on it some time during the present year."

"The temporary lease which the trustees accepted from the Receiver of the Milwaukee & Northern Railroad on May 1, 1879, on a reduced rental, is still in force. By its terms it can be canceled at any time by either party upon 30 days' notice. This railroad for its local business must always compete, more or less, with the Milwaukee, Lake Shore & Western Railroad and with the Chicago & Northwestern Railroad. The business given to it by our road constitutes a large share of its traffic, and is, in my opinion, of far greater value to whatever road we may choose to connect with than any compensation we are likely to receive from operating the Milwaukee & Northern Railroad. On the other hand, the advantage of running our trains to Milwaukee via Menasha rather than by way of Portage City, and over a route which we control through the whole distance, is to be considered; and the continuance of this lease,



until a permanent arrangement can be made upon satisfactory terms with some one of our connecting lines, seems to be at present desirable. No permanent arrangement is possible at present with the Milwaukee & Northern Railroad, because it is about to be sold under its mortgage, and is still in the hands of a receiver. Whether it will then be desirable remains to be seen."

The gross earnings of the 325 miles owned last year were \$439,001, or \$1,351 per mile; of the 129 miles of leased line, \$382,018, or \$2,961 per mile.

#### Chesapeake & Ohio Canal.

This Company owns a canal from Cumberland, Md., to Georgetown, D. C., 184.5 miles, with a branch from Georgetown to Alexandria, Va., 7 miles. Almost its entire business is carrying coal from the Cumberland Region to tide-water. The controlling interest is held by the state of Maryland; nearly all the rest of the stock by the cities of Washington, Georgetown and Alexandria and the United States. The earnings for the year ending Dec. 31, were as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Tolls, wharf & trim'g.	\$223,545.80	\$275,588.67	D.	\$52,042.87 18.9
Rents, etc.	9,770.02	9,310.57	I.	459.45 4.9
Total	\$233,315.82	\$284,899.24	D.	\$51,583.42 18.1
Expenses	\$222,141.96	\$275,588.67	D.	\$53,446.71 23.6
Net earnings	\$11,173.86	\$9,310.57	I.	\$1,863.29 20.0

The decrease is accounted for by the fact that the tonnage carried in 1879 was 71,337 tons less than in 1878. The tolls charged in 1878 were 36 cents from Cumberland to Georgetown, and 4 cents for wharfage, but the times would not admit of increase.

The income statement is as follows:

Balance Jan. 1, 1879	\$43,145.24
Earnings, as above	233,315.82
Loans and sales of bonds	68,145.24
Total	\$344,758.05
Expenses, as above	\$222,141.96
Rent of wharves and incline	35,434.25
Purchase of wharf at Cumberland Basin	12,049.76
Reconstruction and repairs after flood	54,309.19
Coupons paid	7,720.00
Note paid	25,000.00
Excess of expenditures	\$11,888.11

The total expenditure on account of damages done by the flood of November, 1877, was \$238,500.21; payments on this account have been \$39,735.71, leaving a debt of \$198,764.50 still remaining. All the loans negotiated to meet this indebtedness were secured at par. The canal from Cumberland to Georgetown is now in better condition than it has been at any time since 1860. The draft of the boats is greater and the tonnage is increased each trip. There is a telephone line of 200 miles, and it is of great advantage. The contract between the canal and the Baltimore & Ohio Railroad Company has opened up a new trade on the Canal and other trade is in prospect. The President speaks of the various improvements made and says they have been done in the face of business depression.

#### Baltimore & Potomac.

This company owns a line from Baltimore to Washington, 43 miles, with a branch from Bowie, Md., to Pope's Creek, 49 miles, making 92 miles in all. Its entrance into Baltimore is by a tunnel and other costly works, which have made it a very expensive road. It is controlled by the Pennsylvania Railroad Company and its bonds are guaranteed by that company and the Northern Central. The following statements are from the report presented at the annual meeting last week, for the year 1879.

The earnings were as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Gross earnings	\$690,772.05	\$639,076.54	I.	\$51,695.51 8.1
Expenses	\$26,201.69	\$46,186.28	D.	\$19,984.59 43.3
Net earnings	\$173,570.36	\$292,890.26	I.	\$80,080.10 27.3
Gross earn. per mile	7,606.11	6,946.49	I.	659.62 9.5
Net earn. per mile	1,886.63	1,009.68	I.	876.95 86.8
Percent. of exps.	75.19	85.46	D.	10.27 12.0

The profitable part of the road is the line between Baltimore and Washington, the earnings of the Pope's Creek line being very light. The earnings and expenses of the two lines were as follows:

	Earnings.	Expenses.	Net or Def.	Percent.
Main line	\$690,772.05	\$46,186.28	Net \$191,793.71	70.90
Pope's Creek line	38,578.56	50,801.91	Def. 12,223.35	147.23
Total	\$690,772.05	\$526,301.69	Net \$173,570.36	75.19

The gain last year was wholly on the Washington line, the Pope's Creek line showing a small decrease. The gross earnings per mile of the Washington line were \$15,377; of the Pope's Creek line, \$787.

The result of the year was as follows:

Net earnings	\$173,570.36
Interest on funded and other debt	272,317.33
Deficit	\$98,746.97

This deficit was made up by the joint guarantors. The deficit for 1878 was \$182,260.65, showing a large gain last year.

President Bowie's report says: "Satisfactory as were the results for 1879, as shown above, the operations of the first quarter, ending April 30 of the present year, are still more gratifying, the increased net receipts over the same quarter last year being \$37,671.54. The cost of movement per passenger per mile on the Washington line was 2.619 cents, and on the Pope's Creek line 5.915 cents. The average was 2.738 cents, a decrease of 0.245 cents per passenger per mile as compared with 1878. The cost of movement of freight per ton per mile on the Washington line was 1.689 cents, and on the Pope's Creek line 5.846 cents. The average cost was 1.931 cents, a decrease of 0.876 cents per ton per mile as compared with the year 1878. In the construction and equipment account no charge was made during the year 1879."

"The track and road-bed have been greatly improved during the year; 1,115 tons of steel rails, 44,950 new cross-ties, and 4,765 feet of new siding were laid. Of the 48.85 miles of single and second track between Baltimore and Washington 47.23 miles are now laid with steel rails, leaving only about a mile and a half of iron rails at this date on the main tracks. Particular attention has been paid to repairs and renewals of bridges: in addition to repairs of others, new boiler-plate girder bridges were erected at Herbert's Run and Rogue's Harbor, of 60 and 50 feet span respectively. At Big Patuxent River the pier was painted and the wooden superstructure renewed with a wrought-iron bridge at a cost of \$11,546. The cost of the two girder bridges was \$8,286. The Patuxent bridge has been strongly trestled,

preparatory to its renewal during the year with an iron structure.

"Encouraged by the improved condition of the business and finances of the company the pay of our officers and employees was on April 1 last restored to what it had been prior to June 1, 1877, when the great depression in all railroad business necessitated its reduction. This increase was the more gratifying to the board because of the equally faithful and efficient services which all in our employ had rendered under the reduced wages, and this testimonial of fidelity to their trusts is eminently due to our employees. Since the last annual meeting the board has been deprived of the services of one of its most active and useful members by the death of the late Col. Samuel Cox. Living near the terminus of the Pope's Creek line, in a section of the state to be greatly benefited by the construction of the road, Col. Cox was one of its earliest, strongest and most energetic and most liberal supporters. His active efforts had much to do with its successful commencement, and as he has been constantly a member of the board of directors since its organization his loss is deeply felt by his remaining associates."

#### Boston, Concord & Montreal.

This company owns a road from Concord, N. H., north by west to Woodville (Wells River), and thence northeast to Groveton Junction on the Grand Trunk, 145 miles, with a branch from Wing Road by Fabvan to Mt. Washington, 22 miles, making 167 miles in all. Its 34th annual report is for the year ending March 31, 1880.

The equipment consists of 30 engines; 26 passenger, 2 drawing-room, 2 observation and 17 mail and baggage cars; 593 freight cars. Additions during the year were 1 passenger, 2 observation, 1 baggage and 21 freight cars.

The general account, somewhat condensed, is as follows:

Stock, preferred	\$800,000.00
Stock, old dividends, etc.	459,600.00
Stock, new	540,400.00
Total stock (\$10,778 per mile)	\$1,800,000.00
Bonds (\$15,300 per mile)	2,555,800.00
Coupons and dividends unclaimed	15,848.89
Profit and loss	585,094.33
Total	\$4,957,343.22
Road, extensions and branches	\$4,347,000.00
Sinking fund trustees	201,500.00
Pemigewasset House	10,000.00
General Manager's account	35,672.67
Fuel and materials	100,102.73
Cash and bonds on hand	188,077.82
Total	\$4,957,343.22

The bonded debt was increased by \$28,600 during the year, of which \$28,000 was for the completion of the Mt. Washington Branch. The company holds \$116,000 of the bonds, and \$306,000 are in the sinking fund.

The earnings of the year were as follows:

	1879-80.	1878-79.	Inc. or Dec.	P. c.
Passengers	\$200,921.42	\$242,451.96	I.	\$17,409.46 7.2
Freight	383,531.35	315,734.46	I.	67,796.89 21.5
Mail, express, etc.	33,070.57	31,304.07	I.	1,766.50 5.6
Total	\$617,523.34	\$589,490.49	I.	\$28,032.85 4.8
Expenses	\$477,251.40	\$589,490.49	D.	\$112,239.09 19.2
Net earnings	\$200,871.88	\$200,871.88	D.	\$746.73 0.4
Gross earnings per mile	4,000.02	3,536.23	I.	563.79 15.9
Net earnings per mile	1,202.82	\$730.30	D.	4.48 0.4
Percent. of exps.	77.38	65.86	I.	4.52 6.6

The decrease in net earnings was due to increased proportion of earnings paid to other roads, and to the payment of some bills left over from previous years.

The traffic for the year was as follows:

	1879-80.	1878-79.	Inc. or Dec.	P. c.
Train Mileage	367,731	355,082	I.	12,649 3.4
Passenger	411,049	338,196	I.	72,853 21.5
Freight	10,569	11,152	D.	583 5.2
Other	789,349	705,030	I.	84,319 12.0
Passengers carried	247,313	203,715	I.	43,598 21.4
Passenger mileage	8,304,791	6,959,519	I.	1,405,272 20.2
Tons freight carried	192,878	124,332	I.	68,546 55.1
Tonnage mileage	11,572,061	7,459,900	I.	4,112,161 55.1
Av. train load	22.75	19.57	I.	3.18 16.2
Passenger's No.	28.15	22.03	I.	6.09 27.7

Of the passengers carried 94,408, and of the tons freight 171,098, were to and from other roads. The increase in both passenger and freight traffic was very large.

The income account was as follows:

Cash and bonds on hand, March 31, 1879	\$193,461.36
Net earnings for the year	\$200,871.88
Interest received	10,268.80
Sales of consolidated bonds	153,500.00
Wood on hand less than last year	1,113.73
Total	\$559,215.80
Interest, unclaimed coupons, etc.	\$161,283.63
Dividends on preferred stock	45,707.00
Mt. Washington Branch	28,000.00
Convertible bonds taken up	124,900.00
Increase in supplies and Gen. Manager's balance	13,258.01
Total	\$371,148.04

Cash and bonds on hand, March 31, 1880 \$188,067.82

Sales of the consolidated bonds were made to the amount of \$153,500; \$124,900 has been applied to take up the overdue bonds of 1875, and \$28,000 to the construction of the branch road to Mount Washington. The trustees of the sinking fund hold \$306,000 of the bonds due in 1880, the corporation holds \$116,000, and there are \$202,000 outstanding in the hands of other parties.

The company holds woodland costing \$22,451.54; 680 shares of its own stock, costing \$18,432.93, and miscellaneous stocks to the amount of \$7,500.

The equipment is in good condition. During the year two engines and one passenger-car were bought; one observation car, one baggage and smoking-car, two box, three stock and 55 flat cars were built. There were used in renewals 200 tons of steel rails, 716 tons of iron rails and 68,594 new ties; 5,000 Fisher & Norris joints were put in, and 1,386 tons of rails repaired and relaid. A new freight depot and engine-house and a new rail-shop were built. Additional ballast was put down at several points.

The report says: "The directors regret that the increase of the receipts of the business of the road has not been such as to justify them in commencing the construction of that portion of the road between Northumberland and Colebrook. If the present prospects of business should continue, it may be expedient to locate some portion of this extension during the ensuing year. The completion of the Profile & Franconia Notch Railroad during the past year—a narrow-gauge road connecting with this road at Bethlehem station—has provided additional facilities for the transportation of passengers from this road to the Profile Notch of the White Mountains. The business arrangement with the Whitefield & Jefferson Railroad, which connects with this road at Whitefield, the operation of which was commenced in July of last year, has proved quite satisfactory. A branch road has been projected from Lancaster to Kilkenny, with a view of reaching

the extensive tracts of lumber in that section. The corporation has been organized, but nothing has been done toward its construction. Our relations with all the connecting roads have been harmonious, and there is now no apparent reason to apprehend that they may not so continue. No serious accident has happened to any passenger or to property transported over the road during the year."

#### Pittsburgh, Titusville & Buffalo.

This company owns a line from Corry, Pa., south to Oil City and thence northeast to Irvineton, 95 miles, the road forming two sides of an acute-angled triangle. There is also a branch from Titusville to Union, 25 miles, making 120 miles worked during the year 1879, covered by the last report.

Since the close of the year the road has added by consolidation the Buffalo, Chautauqua Lake & Pittsburgh (the old Buffalo, Corry & Pittsburgh), from Corry to Brocton, N. Y., 43 miles. This consolidation was ratified Feb. 16, 1880.

The capital account on Dec. 31, 1879, was as follows:

Stock (\$41,329 per mile)	\$4,959,450.00
Mortgage bonds (\$31,125 per mile)	3,735,000.00
Income bonds and scrip (\$3,258 per mile)	390,555.50
Accounts, balances, etc.	62,585.40
Profit and loss	59,087.82
Total	\$9,207,078.72
Road and equipment (\$75,500 per mile)	\$9,061,122.10
Materials	22,188.20
Cash and receivables	123,768.27
Total	\$9,207,078.72

The mortgage debt consists of \$2,580,000 first-mortgage sectional bonds, and \$1,155,000 second-mortgage or consolidated bonds.

The consolidation above noted made material changes in the capital account. It added \$250,000 to the mortgage debt, making it \$3,985,000, and under it the stock was fixed at \$750,000 preferred and \$6,375,000 common stock, a total of \$7,125,000 or \$43,712 per mile in stock, and \$24,448 per mile in bonds.

The earnings for the year were as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Passengers	\$138,109.12	\$108,764.33	D.	\$29,344.79 27.0
Freight	308,874.52	331,437.00	D.	\$22,562.48 6.8
Mail, express, etc.	23,152.16	20,449.71	D.	\$2,702.45 13.2
Total	\$469,135.80	\$460,651.04	D.	\$8,484.76 1.8
Expenses	\$276,805.20	\$421,190.83	D.	\$144,385.63 34.5
Net earnings	\$190,330.60	\$139,460.21	I.	\$50,870.39 36.5
Gross earn. per mile	3,892.80	4,389.18	D.	\$496.38 11.3
Net earn. per mile	1,580.09	1,538.02	I.	\$42.07 2.7
Percent. of exps.	59.25	64.05	D.	4.80 7.8

The net earnings were 5.096 per cent. upon the total mortgage debt, or 4.613 per cent. on the mortgage and income bonds.

Though freight earnings decreased, there was an increase in tonnage of freight moved, as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Coal, tons	230,575	207,772	I.	22,803 10.9
Oil	182,961	161,551	I.	21,410 13.2
General merchandise	152,451	153,109	D.	\$658 0.4
Total tons moved	625,660	522,432	I.	103,228 19.8

The increase in oil moved is notable, as it is contrary to the course of business for several years past. Coal traffic has been gradually gaining on this road for several years. The consolidation above noted is expected to increase the business in coal and general freights and also the passenger business by enabling the company to control through traffic.

The income account was as follows:

Balance reserve fund from 1878	\$40,357.22
Net earnings for the year	\$190,330.60
Total	\$230,687.82
Interest on first-mortgage sectional bonds	\$180,000.00
Balance	\$50,687.82

From this there was appropriated \$40,425 to pay the coupons due Feb. 1, 1880, on the consolidated bonds. As part of the agreement of consolidation the company has received cash sufficient to pay up all arrears of interest on those bonds.

A supplementary statement gives the earnings for the quarter ending March 31, as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Earnings	\$112,604.34	\$111,102.38	I.	\$1,501.96 1.3
Expenses	\$3,677.80	\$78,352.76	D.	\$14,674.96 18.7
Net earnings	\$48,926.48	\$32,809.62	I.	\$16,116.86 49.1

The road was formerly very prosperous, and for several years paid 10 per cent. dividends; but it has lost heavily by the removal of the centre of oil production, and by the gradual transfer of the local oil business to the pipe lines. It is, however, slowly gaining in coal and general business.

#### Kentucky Central.

This company owns a line from Covington, Ky., opposite Cincinnati, southward to Lexington, 99 miles. It controls and works the Maysville & Lexington, Northern Division, from Paris Junction to Maysville, 49 miles, but the earnings of that line are not included. The following statements were presented at the recent annual meeting, and are for the year ending April 30.

The earnings were as follows:

	1879-80.	1878-79.	Increase.	P. c.
Gross earnings.....	\$608,929.57	\$553,389.08	\$55,540.49	9.9
Expenses.....	385,515.23	344,638.69	40,876.54	11.9
Net earnings.....	\$223,414.34	\$208,750.39	\$14,663.95	7.0
Gross earn. per mile.....	6,141.71	5,589.79	\$551.92	9.9
Net " ".....	2,247.62	2,108.60	\$139.02	6.6
Percent. of exps.....	63.40	62.28	1.12	1.8

The payments for interest were as follows:

Net earnings	\$223,414.34
Interest on bonds	72,100.00
Net surplus	\$151,314.34

From this surplus dividends of 6 per cent. on the preferred and 2 per cent. on the common stock were paid.

The increase in expenses was caused by large outlays for steel rails, new ties and bridges, and by increased train-mileage. Many improvements have been made on the road. One new parlor car and a Mogul freight engine have been ordered, and will be delivered in August next.

There was an increase of 20,524 tons freight carried, or about 16 per cent., and a gain of about 7 per cent. in freight earnings. Lower rates generally were obtained on the freight business, owing to competition at local points, and for the business of the country adjoining the road. The passenger earnings increased \$30,596, or nearly 19 per cent. This was due partly to general improvement of business causing more travel for business purposes and a more free expenditure for pleasure travel, and partly to the greater attention paid to the cultivation and development of passenger traffic. The Maysville & Lexington, Northern Division, continues to be a valuable feeder to the main line.





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## EDITORIAL ANNOUNCEMENTS.

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**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

## TRUNK LINE PASSENGER TRAFFIC.

Last fall there was considerable negotiation concerning a plan for the co-operation of the railroads with regard to their passenger traffic. It went far enough to show that the losses due to the present system are enormous in amount and a very large proportion of the through passenger receipts, and that the difference between the regular rates and those which the companies actually receive does not benefit the passengers to any considerable extent, but goes chiefly to support a class of middlemen, who, when the business is considered as a whole, render no services to either party, but are really paid by the railroad companies to destroy the value of each other's business. There are, indeed, some extraordinary difficulties connected with the through passenger traffic, and, in many cases, roads cannot possibly pursue a policy which will yield them the largest passenger profits without, at the same time, reducing the legitimate profits of other roads by an amount several times as great as their own gains by that policy. The history of passenger tickets between the West and Boston illustrates this very well. A rate from Chicago to Boston, via New York, cannot be made the sum of the Chicago-New York rate and the New York Boston rate and secure any considerable portion of the traffic, so long as the rate via Albany is any where near in proportion to the distance by way of that place to the two cities. By that route it is 960 miles to New York and only about 1,000 miles to Boston—5 per cent. further. But the distance to Boston by way of New York is 25 per cent. further than the distance to New York. The roads must all make the same rates between the same places, if they expect to get any considerable share of the traffic. Suppose the Chicago-New York rate to be \$20, and the Chicago-Boston rate to be made not 5 but 10 per cent. more, or \$22; then the passenger buying a ticket from Chicago to Boston, by way of New York, on reaching the latter city has a coupon for the journey from New York to Boston, which is equivalent to a ticket which costs \$5 in New

York to-day, and until very recently has cost \$6. The natural result is that people going only to New York buy tickets to Boston and sell coupons from New York to Boston for more than the difference between the New York and the Boston rate, but for a good deal less than the regular fare from New York to Boston.

Conversely, the passenger going from Boston to Chicago can get a ticket from New York to Chicago which costs him but \$17, while the regular fare is \$20. Yet such a line as the Pennsylvania Railroad, whose nearest approach to Boston is at New York, is in a manner compelled to ticket passengers through to Boston from such places as Chicago, Toledo and Cleveland. At least it cannot be asked to make a higher rate to Boston than the New York Central makes, and thus lose the greater part of the traffic and the profit on it that it would otherwise get, unless it is in some way compensated for the sacrifice. Something of the same kind takes place when the New York Central sells tickets to Cincinnati via Albany and Cleveland—going 150 miles due north to reach a place considerably south of New York, while the routes via Philadelphia and Baltimore are very direct. In some cases, it is true, there is not much trouble due to such ticketing by circuitous routes, though there must always be a sacrifice of the extra cost of carrying that way; but there is a great number of cases where trouble is caused.

Now every road is entitled to all the profit it can make from any branch of traffic. If the New York Central makes a dollar a piece on Cincinnati passengers, we cannot ask it to give up this business because of the fact that if it did not get it some other road would make three dollars per passenger at the same rates, nor because it reduces the value of the traffic of other roads by more than the amount of its profits on Cincinnati traffic, unless it is compensated for what it gives up. If I am a clothier and get occasional orders for hats, on which I make a profit of a dollar a piece, my neighbor the hatter will not expect me to refuse these orders because he would make two dollars a piece on them. He may very well, however, adduce this fact as a reason why we should make some partnership arrangement concerning this business, by which I shall be secured all the profit I would have got in the old way, while he makes something too, and the customer pays no more than the old price. Moreover, by paying commissions for the sale of tickets, a very considerable proportion of the fares on some routes where no such complications exist (as well as on those that do) is absorbed. During the preliminary investigations and negotiations last fall, it was shown that the losses of the railroad companies in these ways amounted to millions. It has generally been supposed that the passenger traffic of our railroads has been in a comparatively satisfactory condition; because open railroad wars over passenger traffic have been much less frequent than those over freight traffic. The fact has been overlooked that there were other methods of competing for passenger traffic than by cutting rates, and that the machinery and methods employed served to abstract a portion of the regular fares from the company's treasuries in times of peace as well as at other times.

Last fall when the matter was first discussed, it was proposed that a combination should be made by the roads in the Joint Executive Committee, the initiative being taken by the trunk lines; but as usual in beginning anything of the kind, where the conditions are novel, and each party needs to consider the subject in all its bearings, it is difficult to secure the unanimous attention of a large number of parties at once. We believe that statistics of traffic were reported and compared for the trunk lines only, and only their representatives were engaged in the negotiations.

Little was done or said about the matter during the winter, and even this spring it was so difficult to secure attention to it that it seemed doubtful if anything would be done until the railroads should be suffering from insufficient earnings, and so have their attention forcibly directed, as it were, to the great savings that may be had in this way.

Rather unexpectedly, however, recent meetings of the trunk-line presidents took positive action in favor of the scheme, and last week it was voted positively to make a division for the trunk lines from the first of June, on terms and by methods which are yet to be perfected.

This is a very different matter from dividing freight traffic. The traffic cannot be divided, and the best that can be done is to divide the earnings, or such a proportion of them as may be considered equal to the profits on the traffic. There is a difficulty, also, in determining to what part of the passenger earnings the division shall apply. In the freight apportionments only the traffic between "common points" is divided, and that answers perfectly; but in the passenger traf-

fic the discussion last fall tended to show that it would not be easy to say what should be excluded from an apportionment, and it seemed probable that the best solution would be to divide the entire gross passenger earnings.

A change of this kind, or indeed any change in the traffic in passengers which involves the substitution of co-operation for competition, is a most important step. It will have so destructive an effect on many long-established individual interests that it will naturally meet with determined opposition. It is, therefore, desirable that it should be connected with some other change which will have public support—that a reform which will increase the passenger receipts of the railroads should also reduce the average regular fares paid by the public. And this is further desirable because of the want of the second, third and other low-class passenger facilities common abroad, which afford to the great bulk of passengers on the continent of Europe (where by far the largest number travel in third and fourth class cars) cheaper transportation than is to be had here except on some special routes, like those for which emigrant tickets are issued, though our freight rates are the lowest in the world. Moreover, our passenger traffic, as we have often shown, has been in a stagnant condition, showing none of the wonderful elasticity that has characterized our freight traffic. It does not seem as if the introduction of a lower class at low fares could be made to pay; the undoubted increase in passenger traffic and gross earnings would probably be neutralized by the complication introduced. If, then, we can have but one class, it is desirable that the rates for it be suited to the means of the largest class of the population—that of people of moderate means. On most of our roads the average rates received by the railroads (which, as we have said, are less than the average rates paid by the passengers) are somewhat higher than the average second-class rates in France and Germany, though less than the second-class rate in England. It is true that for these rates in most cases passengers get really first-class accommodations in this country. First-class accommodations, however, really do not cost very much more than second-class ones, if only cars and trains run full of passengers; and if by a moderate reduction, limited, perhaps, to special trips or trains, fuller cars and larger trains can be secured, it is reasonable to expect that passenger profits would be increased, while at the same time a welcome accommodation would be afforded to the great mass of the people which would be very popular.

## THE GRAIN MOVEMENT FOR FIVE MONTHS.

With May begins the season of open navigation, and it is usually not till May that all branches of the movement begin to be affected by lake and canal navigation. When the lakes are open in April, as this year and in 1878, the Northwestern shipments are greatly affected thereby; but the Atlantic receipts but to a moderate extent (through lake and rail shipments). And even if the canal is opened in that month (usually two weeks or so after the opening of lake navigation), as it was this year April 20, very rarely indeed are there any receipts by canal at the seaboard until May. This year such receipts were inconsiderable until about May 10. But the winter movement may properly be said to have ended with April this year, and now instead of comparing for the months beginning with December, as we have done heretofore to include the whole period of closed navigation, we compare from the periods beginning Jan. 1.

Now for the five months from Jan. 1 to May 29, receipts and shipments of grain of all kinds (flour not included) at the eight reporting Northwestern markets (St. Louis, Peoria, Chicago, Milwaukee, Duluth, Detroit, Toledo and Cleveland) have been, in bushels, for the past seven years:

Year.	Northwestern Receipts.	Northwestern Shipments.	Atlantic Receipts.
1874.....	62,391,296	42,578,405	50,208,341
1875.....	47,210,000	30,007,467	41,374,920
1876.....	55,528,548	47,437,052	58,020,017
1877.....	46,486,389	35,190,053	46,541,381
1878.....	78,112,524	62,185,390	80,118,174
1879.....	73,247,289	59,329,718	91,849,115
1880.....	91,377,062	69,544,201	90,833,348

Thus we see that this year, so far, the receipts of the Northwestern markets have been 24 per cent. larger than last year, and larger than ever before; the shipments of these markets have been 17 per cent. larger than last year, and also larger than ever before; while the receipts of the Atlantic ports have been about 1 per cent. less than last year, but larger than in any preceding year. Since 1874, which had a heavier movement than any earlier year (from the crop of 1873), the changes are an increase of 47 per cent. in Northwestern receipts, an increase of 63 per cent. in Northwestern shipments and an increase of 81 per cent. in Atlantic receipts; which, it must be remem-



bered, is the growth there has been of this traffic during what has been universally considered a period of extreme industrial depression.

The lakes were open this year in April and May, in last year only in May. To compare the recent movement in shipments from the Northwest, we will do best to confine ourselves to the four weeks of May. In these the shipments by lake, by rail, the total and the proportion of the rail shipments to the total have been:

Year.	By lake.	By rail.	P. c. by rail.	Total.
1874.....	12,546,524	4,086,949	21.8	16,633,473
1875.....	7,376,233	4,171,145	36.5	11,547,378
1876.....	8,000,266	7,237,622	47.5	15,237,888
1877.....	5,375,333	3,592,555	40.1	8,967,888
1878.....	11,161,388	7,729,191	40.9	18,890,579
1879.....	11,341,388	8,949,732	44.0	20,291,120
1880.....	14,785,465	6,178,061	29.5	20,963,526

Thus, while the total May shipments are larger than ever before, the rail shipments in May have been exceeded in 1876, in 1878 and in 1879—all years when rates were demoralized and extremely low—so low that there is no doubt that the gross earnings from May shipments (taking all the roads together) have been materially greater this year than ever before, and the net earnings still more in excess of those of previous years. On the other hand, lake shipments, as was to be expected, have been much larger (30 per cent.) than ever before. But it should be remarked that the extremely low rail rates in 1878 and 1879 did not prevent the vessels carrying up to what appears to have been their full capacity. Only in 1874 had they carried any more, and since that time rates had been so low that the lake marine had been reduced rather than increased; it was only last year that considerable additions were made to the stock of vessels.

The effect of the opening of the canal on the distribution of receipts at the seaboard was felt some 20 days longer this year than last, but not quite so long as in 1878. The receipts at the several Atlantic ports for the five months ending May 29 have been as follows for four years:

	1877.	1878.	1879.	1880.
New York.....	15,148,276	40,113,683	36,122,889	37,346,222
Boston.....	5,125,105	6,710,030	7,955,636	8,202,791
Portland.....	689,493	1,383,721	992,079	1,480,050
Montreal.....	1,235,051	1,893,149	1,846,195	1,741,433
Philadelphia.....	7,523,140	16,575,910	18,104,920	16,072,610
Baltimore.....	13,014,884	15,086,900	20,235,450	16,088,467
New Orleans.....	3,855,657	6,734,589	6,245,733	9,300,058
Total.....	46,591,606	89,095,982	91,333,593	90,832,041

Compared with last year, there is a trifling decrease in the aggregate receipts, but for three years past these receipts have been very nearly alike for the five months, and nearly twice as great as in 1877. Running the eye along the receipts of each city for the three years, we see that the effect of the earlier or later opening of navigation is seen on the New York receipt; it opened earliest in 1878, when its receipts were largest; and this year its receipts are larger than last, when the canal opened later. Boston has shown a steady growth in receipts; Philadelphia received less this year than in either of the two preceding; Baltimore much less than last year, but a little more than in 1878; while New Orleans has had much the largest receipts this year.

The percentage of the total receipts received at each port in these years has been:

	1877.	1878.	1879.	1880.
New York.....	32.5	45.0	39.5	41.1
Boston.....	11.0	7.5	8.7	9.0
Portland.....	1.5	1.6	1.1	1.6
Montreal.....	2.7	2.1	1.8	1.9
Philadelphia.....	16.1	18.6	19.9	17.7
Baltimore.....	27.9	17.6	22.2	18.4
New Orleans.....	8.3	7.6	6.8	10.3
Total.....	100.0	100.0	100.0	100.0

The changes in proportions are considerable in the case of Baltimore and New Orleans, and Baltimore has lost a little more than New Orleans has gained.

The percentages of New York compared with those of Philadelphia and Baltimore taken together have been.

	1877.	1878.	1879.	1880.
New York.....	32.5	45.0	39.5	41.1
Philadelphia and Baltimore.....	44.0	36.2	42.1	36.1
The three cities.....	76.5	81.2	81.6	77.2

Here the two cities last named have a smaller proportion this year than in any of the three preceding—nearly the same, however, as in 1878.

Comparing New York and Boston taken together with Philadelphia and Baltimore together, we have:

	1877.	1878.	1879.	1880.
New York and Boston.....	43.5	52.5	48.2	50.1
Philadelphia and Baltimore.....	44.0	36.2	42.1	36.1
The four cities.....	87.5	88.7	90.3	86.2

A month ago we reported New York's percentage had been but 36.5 per cent. of the whole. Its great increase has been owing to the opening of canal navigation, which adds to it alone the chief of all the grain carriers. To illustrate what a change the opening of lake and canal navigation causes, we compare the percentages of each port last May with those of the month previous, when, though the lakes were open, there

were no arrivals either at New York or Montreal by water:

	April.		May.	
	Bushels.	Per cent.	Bushels.	Per cent.
New York.....	9,026,902	34.8	12,077,801	56.1
Boston.....	2,454,183	9.5	1,373,760	6.4
Portland.....	399,377	1.6	29,800	0.1
Montreal.....	71,922	0.3	1,501,075	6.9
Philadelphia.....	5,440,060	21.0	3,618,400	16.8
Baltimore.....	5,624,800	21.7	1,878,350	8.7
New Orleans.....	2,898,172	11.1	1,057,551	4.9
Total.....	25,917,356	100.0	21,536,737	100.0

In this table five weeks are included under April and only four under May, so that the average weekly receipts have not been greatly different in the two months—5,183,471 bushels in April and 5,384,184 in May.

The change, thus, is not, as might be supposed, an increase in the receipts of New York equal to the canal receipts and to the increase in the total movement, while the quantities received at other ports remain the same and only the percentages of the whole are brought down by the increase in the aggregate. Instead, the receipts at those ports which receive only by rail are absolutely decreased—very largely in some cases—for the very natural reason that New York has suddenly become the terminus of the cheapest route. It gets a third more in May than in April, Boston nearly one-half less, Philadelphia one-half less, Baltimore only one-third as much. Some other changes need explaining. Portland virtually ceases to be a grain receiver and exporter after the port of Montreal is open. The steamers that sail from Portland in winter then sail from Montreal, which, then first begins to be a grain receiver. As to New Orleans, it has never had much grain traffic in spring and summer; but then till lately it never had much in winter. The very considerable receipts which it had last winter indicated that it could do a business as large as Boston's probably, whenever the rail rates were maintained on a basis of 40 cents per 100 lbs. from Chicago to New York. Whether the improvement of the mouth of the Mississippi would enable it to compete successfully with the lake-and-canal route remained to be seen. Lake and canal rates have been higher this spring than before for several springs, but so far the Mississippi route does not seem to be able to compete with them. While it had 11.1 per cent. of the aggregate business in April, in May it had but 4.9 per cent. of it, and its average weekly receipts fell from 579,634 to 264,388 bushels. It should be said, however, that it has not been affected more than some places that receive by rail alone, and not so much as Baltimore.

As the increase of New Orleans receipts this year has changed the conditions of competition considerably, we will do well to consider by themselves the receipts of the four Eastern ports which compete chiefly with each other for the grain trade. Later in the season Montreal will compete with them also, but so far its receipts have little effect. It will be well to bear in mind that New York and Boston have a large traffic in flour, but the other two cities only a small one, and that flour is not included in these tables.

The receipts of grain of all kinds at these four Eastern United States ports, then, for the five months from Jan. 1 to June 2 (four days more than in the above tables) have been, in bushels, for two years:

	1879.	1880.
New York.....	37,553,109	36,054,500
Baltimore.....	16,078,076	20,182,095
Philadelphia.....	16,304,500	18,782,271
Boston.....	8,157,820	7,985,414
The four ports.....	78,073,505	83,004,280

The large increase in water receipts at New York is due to the fact above mentioned, that the canal was open much longer this year. Arrivals by canal began about May 4 this year, but not till about May 22 last year, so that the average canal receipts per day were about 307,319 bushels this year, against 321,945 last year. In either year there were some straggling receipts by canal at earlier dates than those named, but none or next to none of boats that cleared from Buffalo the same season, and not enough in the total to have much effect.

The gain at New York is caused by this longer period of open canal navigation; but though there is a very considerable decrease in its rail receipts (11.8 per cent.), it is not so large in proportion as at Philadelphia (13.2 per cent.), or at Baltimore (17.4 per cent.).

The percentage of the total arriving at each port has been:

	New York.	Baltimore.	Philadelphia.	Boston.
1879.....	43.5	24.3	22.6	9.6
1880.....	47.7	24.2	20.7	10.4

Philadelphia and Baltimore together had 46.9 per cent. of the receipts last year, against New York's 43.5; this year they have but 41.9, against New York's 47.7.

If we take into consideration rail receipts only, there has been a decrease this year of nearly 10,000,000 bush-

els, or 12 per cent., in the aggregate receipts of the four ports, and the percentage of each has been:

	New York.	Baltimore.	Philadelphia.	Boston.
1879.....	40.6	25.5	23.8	10.1
1880.....	40.8	24.0	23.5	11.7

Here we see that the differences are inconsiderable, and consist chiefly of a gain at Boston balanced by a nearly equal loss at Baltimore.

Naturally it is to be expected that the percentage of New York should go on increasing while navigation opens; but it must be said that very recently Baltimore and Philadelphia receipts have increased, and the stiffening of lake and canal rates tends to put the whole traffic nearer to the winter conditions, the difference in favor of the water route being too small to turn traffic away from the railroads; as we write, it costs about 16 cents a bushel to ship wheat from Chicago by lake and canal to New York, against 18 cents by rail, and 16.2 to Baltimore by rail.

There has been an advance in water rates nearly every week, and should this continue, New York's advantage will be reduced, and its percentage of the summer receipts will be smaller than if water rates had remained as low as in the first or second week after navigation opened. This strength of the water rates while the price of grain is quite moderate is very encouraging for the prospects of a profitable summer and fall grain traffic on the railroads, but the lower prices anticipated after harvest may change this. About ten cents a bushel less is paid for wheat to be delivered in August than for present deliveries, and for the former only about 92 cents a bushel, which will not leave a great deal in the hands of the trans-Mississippi not to say the trans-Missouri farmer; and if the present prospects of an enormous home crop (which in the case of spring wheat may still be upset) and of an abundant harvest abroad are fulfilled, prices will doubtless go lower still, and it will not be easy to maintain current rates by lake and canal, in spite of the vast quantity of grain to go forward.

#### Trunk Line Earnings.

Earnings for April have now been reported for the three leading trunk lines, which show the following returns:

	1880.	1879.	Increase.	P. c.
New York Central & Hudson River.....	\$2,782,324	\$2,214,036	\$567,088	25.6
New York, Lake Erie & Western.....	1,643,151	1,373,755	270,396	19.7
Pennsylvania.....	3,486,376	2,928,032	558,344	19.2

This is a very satisfactory showing in every case, but especially so for the Pennsylvania. It and the Erie report expenses as well as earnings. The Pennsylvania's were 25 per cent. larger this year than last, but the Erie's were almost the same (\$1,028, or 1.7 per cent., less), and the increase in the net earnings for the month was no less than 66½ per cent., while the Pennsylvania's was 45 per cent. Here we see the effect of the improvements that have been made on the Erie road in its second track, steel rails, third rail, and especially its new stock of powerful engines, which permit the hauling of much larger average freight trains without much more than the former average expenses for a light train. For the seven months of the fiscal year ending with April this company's expenses have been increased but 4.7 per cent., though its gross earnings have increased 14.4 per cent. The result is that the net earnings have increased 37.4 per cent. This increase in net earnings for the seven months amounts to more than a million of dollars. For the same seven months the increase in gross earnings of the New York Central was 15.8, or a little more than on the Erie.

The latter company has also reported gross earnings for May, and shows an increase compared with last year of about 15 per cent.—not nearly so great as in April. For the eight months ending with May the increase in its gross earnings is the very handsome sum of \$2,924,705, or 15.6 per cent. If the expenses were the same proportion of the receipts as last year, then the increase in net earnings has been nearly two millions, which is equivalent to more than 2 per cent. on the capital stock. The largest increase made so far this fiscal year in any one month on this road was in December, and the next largest in January. In both these months the traffic was greatly reduced by a snow blockade last year. Aside from these the largest increase was in April. In May, the road was more affected by canal traffic this year than last, because the canal was open about twice as long this year.

For the four months of the calendar year, the returns of the three roads are:

	1880.	1879.	Increase.	P. c.
New York Central.....	\$10,548,003	\$8,924,134	\$1,623,869	18.2
Erie.....	5,836,709	5,084,100	752,609	14.8
Pennsylvania.....	3,721,053	3,805,569	-84,516	-2.2
Total.....	\$20,105,765	\$17,813,793	\$2,291,972	12.8

Total (gross earnings).....\$20,105,765 \$17,813,793 \$2,291,972 12.8

Assuming the increase in net earnings to be in proportion to that of gross earnings on the New York Central (it is much larger on the other roads), the aggregate net earnings of these three trunk lines have increased from about \$9,300,000 last year to \$12,300,000 this year, or nearly one-third. The difference in circumstances have been chiefly a larger passenger traffic, a larger local traffic, a much larger



west-bound through traffic, and about the same east-bound through traffic at very much higher rates. Throughout the four months last year east-bound rates were badly demoralized, and throughout they have been well maintained this year. In view of the general development of traffic, however, much of it very much more profitable than east-bound through freight at its best, it is easy to place too much stress on the effect of the better rates on the latter. This traffic has been by far the largest single item in the traffic of the trunk lines throughout the dull times; but with the revival of prosperity it becomes a smaller proportion of the whole in bulk, and a still smaller one in earnings. To the improved rates on it, however, is doubtless due a very large share of the increased profits of the roads this year, though it is almost the only branch of trunk-line traffic that has not increased materially.

Hereafter all the trunk lines have to compare with a period about two-thirds of which was very unfavorable and one third quite favorable to railroad earnings. It was not till the 20th of August last year that rail rates were made as high as they are now on east-bound freight. This, however, as we have said, is but one element in the better condition of business; west-bound freight, which yields much higher average rates, is very much larger and so is general passenger traffic, while immigrant traffic, which is an important item on the trunk lines, is truly enormous, and several times as great as last year. This traffic, though carried at low rates, is decidedly profitable, because it is carried in enormous trains, yielding probably much greater gross, not to say net, earnings than the first-class expresses with their long rows of sleeping cars which carry, even when full, but a quarter as many as an immigrant car.

#### Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

*Quincy, Missouri & Pacific*.—Extended west to Milan, Mo., 5 miles.

*Flint & Pere Marquette*.—The Round Lake Branch is completed from Butler Junction, Mich., north to Webber, 4 miles.

*Chicago, Milwaukee & St. Paul*.—The Iowa & Dakota Division is extended from James River, Dak., west to Mitchell, 14 miles.

*Springfield & Western Missouri*.—Extended from Ash Grove, Mo., west by north to Greenfield, 17 miles.

*Baltimore & Cumberland Valley*.—Extended from the Maryland line northward to Waynesboro, Pa., 4½ miles.

*Texas & Pacific*.—Extended west to Weatherford, Tex., 9 miles.

*West Jersey & Atlantic*.—Extended from May's Landing, N. J., eastward to Atlantic City, 17 miles, completing the road.

This is a total of 70½ miles of new railroad, making 1,590 miles thus far this year, against 661 miles reported at the same time in 1879, 413 miles in 1878, 570 miles in 1877, 698 miles in 1876, 293 miles in 1875, 537 miles in 1874, and 1,181 miles in 1873.

MR. ALBERT FINK sailed for Europe for a two months' vacation last Saturday, and we take advantage of his absence to call attention to the extraordinary and unique services which he has rendered to the railroad community through a rare combination of talent and character. Great as has been the intellectual ability he has shown in designing practicable plans for the co-operation of the railroad interests, there can be hardly any doubt that their successful execution has been due chiefly to the disposition and character of the man. In the first place, it at once became evident to all engaged in negotiations with him that the one object at which he aimed was the common good of all parties alike. He never represented one interest or one class of interests, but always all interests at once; and was aiming to secure the best permanent advantage of each road just as much as its own president or manager. Contact with him immediately convinced every one of his complete disinterestedness, freedom from prejudice and tremendous earnestness in efforts to secure the common good. This almost from the first gained him universal confidence. Then in the delicate work of his position—bringing together different interests and opinions, protesting against injurious or prohibited policies and prevailing upon the authors of them to abandon them, disarming prejudices, and, in a word, leading a large number of independent managements, represented by men of decided views, strong wills and great abilities, who are more accustomed to lead than to follow, to harmonious and even unanimous action concerning their most important interests—he has displayed such remarkable skill and success that in spite of his brilliant record as an engineer and an administrator, we sometimes feel as if he had missed his vocation, and was born a diplomat. He has certainly achieved a great and wide-spread reputation within the past few years that he has been identified with the efforts towards railroad co-operation; but though many may have something like an adequate idea of the value of the work he has achieved, there can be very few who have anything like an adequate idea of the extraordinary difficulties that stood in the way of accomplishing it, or of the extraordinary skill with which they have been overcome.

THE BAVARIAN EXPERIMENTS ON TRAIN RESISTANCES, the account of which, by Baron Von Weber, we publish this week, seem to have been made with unusual care and effort to escape all avoidable sources of error; but the results differ so far from those commonly accepted, and for the higher

speeds—that is, the speeds used in practice, for nothing more than 27 miles an hour was experimented with—are so very much greater, that they will be read with astonishment by many. Full details of the experiments, the method of observation, and the measurements of the different kinds of resistance are not given in Baron von Weber's communication; but will appear in a volume specially devoted to the experiments. They were, it must be remembered, intended especially to ascertain the additional resistance due to curves of different radii, and as the cars used were of the European plan, with four wheels and a wheel-base very much longer than that of the truck of one of our cars, the results cannot be applied without modification to our rolling stock. Very astonishing effects are reported as caused by greasing the flange sides of the rail-heads. On the shortest curve used (331 ft. radius), the resistance was scarcely any more than on a straight line when this lubrication was practiced on both rail-heads. The curve resistance, moreover, is found to be independent of the speed, while the other resistance increases rapidly.

PETROLEUM EXPORTS continue to increase, and New York continues to get all the increase. For the five months ending with May there was an increase of 10,100,000 gallons in the total exports, and an increase of 15,000,000 gallons at New York. Philadelphia gained a little (390,000 gallons, which is less than 2 per cent.), but Boston lost more than half (1,150,000 gallons) and Baltimore lost one-third, or 3,500,000 gallons. But the growth of the traffic has little in it that is encouraging to the carriers. Petroleum, no doubt, can bear a high rate—more than almost any other export; partly because it is obtained in no other country in large quantities, and also because no other illuminating material can compete with it, even at three or four times its actual price. But the practicability and cheapness of a pipe line prevents, and seems likely to prevent for ever, anything more than a very moderate rate on oil going to the seaboard. It is true that the existing Tidewater Pipe Line has made a combination with the railroads, and that rates are maintained; but they are maintained at what is a very low rate compared with what has been received sometimes.

LAKE RATES have still further advanced, reaching, Tuesday, 7½ cent per bushel for corn and 8 for wheat from Chicago to Buffalo—rates not reached before fall for many years and four times as high as the rates current at this time last year. Canal rates have been substantially stationary at 6 and 6½ cents from Buffalo to New York. Ocean rates did not remain at the exceptionally low rate of 3d. per bushel by steam from New York to Liverpool that were made for two or three days last week, but have been pretty steady at 4d.

FOREIGN IMMIGRATION is now the largest ever known. In May the arrivals at New York were 55,250, against 18,109 in May last year. For the year ending with May the arrivals at this one port were 236,017 this year, against 92,801 the preceding year. A daily average of more than 2,000 passengers, most of whom go West, gives, as may be conceived, the New York railroads something to do. Most of the immigration is by way of New York, but there is some to the other northern ports which have steamer lines.

## General Railroad News.

### MEETINGS AND ANNOUNCEMENTS.

#### Meetings.

Meetings will be held as follows:  
*Pittsburgh, Titusville & Buffalo*, special meeting, to vote on the proposed consolidation with the Buffalo & Southwestern, at the office in Philadelphia, July 6, at noon.

*St. Johnsbury & Lake Champlain*, special meeting, to ratify the act of the directors in issuing preferred stock under the agreement of reorganization, and to vote on executing a mortgage for \$200,000, in St. Johnsbury, Vt., June 30, at 1 p. m.

*St. Paul & Duluth*, annual meeting, at the office in St. Paul, Minn., June 21, at noon.

*Scioto Valley*, special meeting, to vote on increasing the capital stock \$500,000, and extending the road, in Columbus, O., July 1.

*Buffalo & Southwestern*, special meeting, to vote on consolidation with the Pittsburgh, Titusville & Buffalo, in Buffalo, N. Y., July 6.

#### Dividends.

Dividends have been declared as follows:  
*New York Central & Hudson River*, 2 per cent., quarterly, payable July 15.

*New York & Harlem* (leased to New York Central & Hudson River), 4 per cent., semi-annual, payable July 1.

*Chicago & Northwestern*, 1½ per cent., quarterly, on preferred stock, and 3 per cent., on common stock, payable June 29.

*Morris & Essex* (leased to Delaware, Lackawanna & Western), 3½ per cent., semi-annual, payable July 1.

*Connecticut River*, 4 per cent., semi-annual, payable July 1.

*Lehigh Valley*, 1 per cent., quarterly, payable July 15.

#### Foreclosure Sales.

The *Savannah & Memphis* road was re-sold in Opelika, Ala., June 5, and bought for \$834,500 by O. H. Palmer, Mason Young and H. W. Sibley, acting for the bondholders. The road was sold a few weeks ago, but a re-sale was ordered. The road extends from Opelika to Goodwater, 60 miles.

The *Savannah & Charleston* road was sold in Charleston, June 7, for \$300,200, the purchaser being H. B. Plant, acting for the bondholders. The parties joining in the purchase are the same who own the Savannah, Florida & Western (the old Atlantic & Gulf) road. The purchasers have already organized a new company. The road extends from Savannah, Ga., to Charleston, S. C., 106 miles, with a branch to the Ashley River near Charleston, 5½ miles long. The latest statement gives the funded debt at \$1,427,800, but we believe there are some receiver's certificates outstanding. The road has been in litigation a long time.

The *Milwaukee & Northern* road was sold in Milwaukee June 6, under foreclosure, and bought for \$1,500,000 by Guido P. Fisher and E. H. Mariner, trustees for the bond-

holders. The road extends from Menasha, Wis., to Schwartzburg, 93 miles, with a branch from Hilbert to Green Bay, 27 miles, and the company held the right to use the Chicago, Milwaukee & St. Paul track from Schwartzburg to Milwaukee, 9 miles. The latest statement makes the bonded debt \$2,134,000. The road is leased and worked by the Wisconsin Central.

### Passenger Conductors' Insurance Company of the United States.

This Association met in annual convention at Nashville, Tenn., May 31, with a full attendance of delegates. Mr. O. W. Merrill presided, and Mr. Walter Lackey was Secretary. After the appointment of committees the President made an appropriate address. An address of welcome was also made by Mr. M. L. Blanton, of Nashville.

The Secretary presented his report showing total receipts of \$17,802.41, and payments of \$16,103.74, leaving a balance of \$1,698.67 on hand. Of the payments \$1,206.74 were for current expenses and salary, the rest on assessments. There are 1,195 members, 860 in the first series and 335 in the second series.

After electing officers the meeting adjourned until next day.

On the second day committee reports were received. It was decided to hold the next annual convention in Kansas City. It was resolved to adopt the *Alliance*, published in Indianapolis, as official organ of the Association.

After adopting the usual resolutions of thanks, etc., the Association adjourned. The meeting closed with an excursion to Chattanooga.

#### St. Louis Passenger Meeting.

A meeting of the representatives of all lines terminating at St. Louis was held in that city, May 29, for the purpose of consulting and acting upon various matters of importance to St. Louis lines. Mr. H. B. Blood presided, and George H. Daniels acted as Secretary.

Mr. E. A. Ford stated that the object of the meeting was to consider the feasibility of forming a local association of the general passenger and ticket agents of the lines terminating at St. Louis, with a view to harmonizing conflicting interests, making and carrying out such agreements as might be necessary, and settling among themselves such difficulties as might arise from time to time in the conduct of the business.

The following were unanimously adopted:

*Resolved*, That no reduction from regular rates shall be offered during the season of 1880, for any purpose, or on any account whatever, to competitive points, except by agreement in each case of all lines in interest, and except at rates quoted in St. Louis tariff. This resolution includes special chartered trains.

*Resolved*, That tickets of the St. Louis, Keokuk & Northwestern Railway Company, and of the Keokuk Northern Line Packet Company, recently ordered off sale, via St. Louis, may be placed on sale again, with the distinct understanding that if the tickets of either or both companies shall be so manipulated as to interfere with rates from St. Louis to Eastern points they shall again be withdrawn from sale.

Messrs. George H. Daniels, J. D. Brown and John W. Mass were appointed a committee to draft a constitution and by-laws for the organization of a St. Louis Association of general passenger and ticket agents.

A resolution was passed to the effect that all applications for reduced rates of a general character be referred to the Secretary for reply.

The meeting adjourned until Tuesday, June 22.

### ELECTIONS AND APPOINTMENTS.

*Allegheny Valley*.—Mr. Charles B. Price has been appointed Car Accountant of this company, vice J. W. Reinhart, resigned. To take effect June 1, 1880.

*Arkansas Midland*.—Mr. J. J. Horner has been elected Vice-President of this company. Mr. S. J. Clark has been chosen Secretary, in place of Charles C. Waters, resigned.

*Baltimore & Hanover*.—At the annual meeting in Hampstead, Md., May 27, the following were elected: President, Capt. A. W. Eichelberger; Vice-President, W. H. Vickery; Directors, W. H. Hoffman, Stephen Keefer, L. T. Meisheimer, Charles W. Slagle, C. C. Woodin; Secretary, L. F. Meisheimer; Treasurer, Robert M. Wirt.

*Boston & New York Air Line*.—At the annual meeting in Middletown, June 1, the following directors were chosen: John N. Camp, Middletown, Conn.; Silas F. Loomer, Wilimantic, Conn.; S. E. Baldwin, Henry G. Lewis, New Haven, Conn.; D. L. Watson, Bridgeport, Conn.; Samuel S. Sands, Brooklyn, N. Y.; H. W. Webb, H. B. Hammond, D. B. Hatch, E. H. Bonner, J. D. Smith, New York. The board elected H. B. Hammond, President; Thomas L. Watson, Secretary; D. B. Hatch, Treasurer; J. H. Franklin, Superintendent.

*Bucksport & Bangor*.—This road is now operated by Mr. L. L. Lincoln as Lessee and Superintendent. His office is at Bucksport, Maine.

*Canada Atlantic*.—At the annual meeting in Montreal, May 26, the following directors were chosen: D. A. Macdonald, E. McGillivray, W. G. Perley, A. McNab, James Frazer, R. P. McDonald, Peter Kennedy, J. R. Booth, John Rankin, Guy C. Noble, Duncan A. Macdonald, James Clarke. The following officers were afterward re-elected: D. A. Macdonald, President; E. McGillivray, First Vice-President; W. G. Perley, Second Vice-President.

*Canada Southern*.—The following circular is dated June 5: "Mr. M. H. Taylor (formerly Assistant Treasurer) has this day been appointed Auditor of this company, with office at St. Thomas, Ontario."

"Mr. C. F. Cox has been appointed Assistant Treasurer and Assistant Secretary, with office at Grand Central Depot, New York."

"Mr. Thomas Eedson has been appointed Cashier, with office at St. Thomas, Ontario."

"All communications relating to matters of accounting should be addressed to the Auditor, and all remittances heretofore made to the Assistant Treasurer, should hereafter be forwarded to the Cashier. Vouchers will continue to be paid from the Treasurer's office, at New York."

*Central, of Georgia*.—At a meeting of the board in Savannah last week, it was decided to create the office of Vice-President, and Capt. W. G. Raoul was chosen to that position. Captain Raoul has been for a long time on the Southwestern Railroad; he was Road-Master at first, and became Superintendent when Colonel Powers was made General Commissioner of the Southern Railway & Steamship Association.

Gen. G. M. Sorrell was chosen Manager of the Steamship Bureau, also a new office. He will not take full charge until Sept. 1 next.

*Chesapeake & Delaware Canal*.—At the annual meeting in Philadelphia, June 7, the following were chosen: President, Andrew C. Gray; Directors, H. Pratt McKean, John F. Gilpin, Thomas A. Biddle, Isaiah V. Williamson, Charles H. Hutchinson, Edwin Swift, David Scull, Mahlon P.



Hutchinson, John R. Baker, Charles Dutilh, Gustavus S. Benson, James C. Fisher, Henry C. Ford, Joseph E. Sillingham.

**Chesapeake & Ohio Canal.**—At the annual meeting in Annapolis, Md., June 7, the following were chosen: President, A. P. Gorman; Directors, M. Bannon, James G. Berrett, H. D. Farnandis, P. Hamill, John Humbird, Thomas E. Morgan. The only change is the election of Mr. Morgan in place of Dr. Crawford.

**Cheshire.**—At the annual meeting in Keene, N. H., June 2, the old board was re-elected as follows: Samuel Gould, John B. Meer, Ephraim Murdock, Jr., Wm. A. Russell, Edward C. Thayer, George F. Williams, James H. Williams. The board elected Wm. A. Russell President; Edward C. Thayer, Vice-President.

**Chicago & Northwestern.**—At the annual meeting in Chicago, June 3, the following directors (one-third of the board) were chosen for three years: Marvin Hughitt, Chicago; John W. Burke, David Dows, Sidney Dillon, D. O. Mills, New York. The only new director is Mr. Mills, who succeeds David Jones. The board elected the following officers: President, Albert Keep, Chicago; Vice-President, Secretary and Treasurer, M. L. Sykes, New York; Second Vice-President, General Manager and General Superintendent, Marvin Hughitt, Chicago; Executive Committee, Albert Keep, W. L. Scott, A. G. Dulman, Chauncey M. Depew, Augustus Schell, Samuel F. Barger, D. O. Mills. The office of Second Vice-President has not been filled before for several years.

**Chicago & Northwestern Proprietary Lines.**—At the annual meeting in Chicago, June 3, the following were chosen: **Winona & St. Peter.**—Albert Keep, James H. Howe, David Dows, A. G. Dulman, M. Hughitt, M. L. Sykes, Augustus Schell, W. L. Scott, J. B. Redfield, Directors; Albert Keep, President; M. L. Sykes, Vice-President and Treasurer; S. O. Howe, Secretary; J. B. Redfield, Assistant Secretary; A. Keep, M. L. Sykes and M. Hughitt, Executive Committee. **State Line & Union.**—Albert Keep, James H. Howe, David Dows, A. G. Dulman, William L. Scott, M. M. Kirkman, J. B. Redfield, Directors; Albert Keep, President; M. L. Sykes, Vice-President; J. B. Redfield, Secretary; M. M. Kirkman, Treasurer. **St. Charles.**—Albert Keep, M. L. Sykes, M. Hughitt, M. M. Kirkman, J. B. Redfield, Directors; Albert Keep, President; M. L. Sykes, Vice-President, Secretary and Treasurer; J. B. Redfield, Assistant Secretary; M. M. Kirkman, Assistant Treasurer. **Elgin & State Line.**—Albert Keep, James H. Howe, David Dows, A. G. Dulman, M. L. Sykes, Wm. L. Scott, Marvin Hughitt, M. M. Kirkman, J. B. Redfield, Directors; Albert Keep, President; M. L. Sykes, Vice-President; J. B. Redfield, Secretary; M. M. Kirkman, Treasurer. **Dakota Central.**—Albert Keep, M. Hughitt, M. L. Sykes, Thomas Wilson, M. M. Kirkman, Directors; Albert Keep, President; M. L. Sykes, Vice-President; J. B. Redfield, Secretary; M. M. Kirkman, Treasurer. **Chicago & Milwaukee.**—Albert Keep, James H. Howe, David Dows, Marvin Hughitt, A. G. Dulman, M. L. Sykes, William L. Scott, Augustus Schell, J. B. Redfield, Directors; J. H. Howe, President; A. Keep, Vice-President; M. L. Sykes, Secretary and Treasurer; J. B. Redfield, Assistant Secretary. **Chicago & Dakota.**—Albert Keep, M. Hughitt, M. L. Sykes, Thomas Wilson, J. B. Redfield, Directors; Albert Keep, President; M. L. Sykes, Vice-President; M. M. Kirkman, Treasurer; J. B. Redfield, Secretary; S. Sanborn, Assistant Secretary. **Rochester & Northern Minnesota.**—Albert Keep, M. L. Sykes, M. Hughitt, J. B. Redfield, J. V. Daniels, Directors; Albert Keep, President; Marvin Hughitt, Vice-President; J. B. Redfield, Secretary; M. M. Kirkman, Treasurer. **Minnesota Valley.**—Albert Keep, M. Hughitt, W. F. Dickinson and Thomas Wilson, Directors; Albert Keep, President; Marvin Hughitt, Vice-President; J. B. Redfield, Secretary; M. M. Kirkman, Treasurer. **Menominee River.**—Albert Keep, M. L. Sykes, Marvin Hughitt, J. B. Redfield and M. M. Kirkman, Directors; Albert Keep, President; M. L. Sykes, Vice-President; J. B. Redfield, Secretary; M. M. Kirkman, Treasurer. The stockholders of the Northwestern Union did not meet, but directors elected the following officers: Albert Keep, President; M. L. Sykes, Vice-President and Treasurer; J. B. Redfield, Secretary; John B. George, Assistant Secretary.

**Chicago, Burlington & Quincy.**—It is understood that not many official changes will result from the consolidation of the Burlington & Missouri River in Nebraska with this company. Mr. Thomas J. Potter will, it is said, be General Manager of lines east of the Missouri River, and Mr. E. A. Touzalin of all lines west. The position of General Traffic Manager, vacated by Mr. Smith, will not be filled. Messrs. E. P. Ripley and P. Lowell will be General Freight Agents for the divisions east and west of the Union.

**Chicago, Milwaukee & St. Paul.**—At the annual meeting in Milwaukee, June 5, the old board was re-elected, as follows: Alexander Mitchell, S. Merrill, John Plankinton, Milwaukee; Jason C. Enston, Chatfield, Minn.; Selah Chamberlain, Cleveland, O.; John M. Burke, Hugh T. Dicky, David Dows, Peter Geddes, Jeremiah Milbank, James Stillman, Abraham R. Van Nest, Julius Wadsworth, New York. The board re-elected Alexander Mitchell, President; Julius Wadsworth Vice-President.

**Chicago, Rock Island & Pacific.**—At the annual meeting in Chicago, June 2, the four directors whose terms then expired were re-elected for three years, as follows: George G. Wright, Des Moines, Ia.; A. G. Dulman, R. P. Flower, Benjamin Brewster, New York. Mr. James R. Cowing, of New York, was chosen a director in place of Charles R. Marvin, resigned. The board elected officers as follows: President, Hugh Riddle; First Vice-President, David Dows; Second Vice-President, R. R. Cable; Secretary and Treasurer, F. H. Tows; Executive Committee, Hugh Riddle, David Dows, F. H. Tows, R. P. Flower and R. R. Cable. The office of Second Vice-President is new; it is filled by Mr. R. R. Cable, who has been for some time Assistant to the President.

Mr. Cable has also been appointed General Manager of the road.

**Cincinnati, Hamilton & Dayton.**—At the annual meeting in Cincinnati, June 8, the following directors were chosen: J. H. Devereux, H. B. Hurlburt, Stevenson Burke, L. D. Harrison, Martin Bare, John Carlyle, M. E. Ingalls, H. D. Huntington, M. M. White. Messrs. Devereux, Hurlburt, Burke, Carlyle, Ingalls, Huntington and White are new directors, succeeding Theodore Cook, Rufus King, Henry Lewis, Joseph H. Rogers, R. M. Shoemaker, F. H. Short and Preserved Smith. It is understood that Gen. Devereux is to be President.

**Columbus & Maysville.**—At the annual meeting, May 25, in Hillsboro, O., the following directors were chosen: C. S. Bell, Joseph G. Richards, D. F. Scott, J. H. Jolly, W. R. Smith, D. M. Barrett, Daniel McLean, Joseph Cochran, J. P. Surber, H. N. Kennedy, J. W. C. Loudon, J. C. Liggett, Chambers Baird. The board elected C. S. Bell, President; W. R. Smith, Vice-President; Thomas Hibben, Secretary

and Auditor; E. L. Ferris, Treasurer; Col. F. J. Picard, Engineering Superintendent.

**Grand Haven.**—Mr. Hugo Haebringer, Auditor and General Passenger Agent, having resigned, Mr. George D. Fish has been appointed Auditor, and B. C. Leavenworth General Freight and Passenger Agent.

**Havana, Ran'oul & Eastern.**—Mr. A. S. Hershberger has been appointed General Freight and Ticket Agent, in place of B. F. Matthias, resigned. Mr. Frank B. Ogden is appointed Auditor, in place of Alonzo Luckey, resigned.

**Illinois Midland.**—The following circular from the Receiver, Mr. L. Genis, is dated Terre Haute, Ind., June 1: "The office of Superintendent having been discontinued, you will please hereafter address to me all communications in reference to that department."

"Mr. Day K. Smith has been appointed Superintendent of Transportation."

**Kansas Central.**—Mr. G. W. Vaughn has been appointed Chief Engineer, in place of O. B. Gunn, resigned.

**Kansas City, Fort Scott & Gulf.**—Mr. B. L. Winchell is appointed Assistant General Passenger and Ticket Agent of this company and of the Kansas City, Lawrence & Southern, to date from June 1.

**Knoxville & Cincinnati Southern.**—Mr. W. A. Gunn has been appointed Chief Engineer. His headquarters will be in Knoxville, Tenn.

**Lewisburg, Centre & Spruce Creek.**—At the annual meeting in Philadelphia, June 8, the following were elected: President, Strickland Kneass; Directors, G. B. Roberts, Edmund Smith, Wistar Morris, J. N. DuBarry, Eli Shifer, James P. Coburn, G. A. Miller; Secretary and Treasurer, James R. McClure. The road is leased to the Pennsylvania.

**Little Rock, Mississippi River & Texas.**—The following circular is dated May 29:

"The following appointments are made, to take effect on June 1:

"Mr. S. I. Phelps, Assistant Superintendent and Master of Transportation; office at Arkansas City, Ark.

"Mr. H. G. Alts, General Passenger Agent and Auditor; office at Pine Bluff, Ark.

"Mr. E. W. Outlaw, Assistant General Freight Agent; office at Arkansas City, Ark.

"Mr. S. A. Callanen, Road-Master; office at Pine Bluff, Ark.

"All business connected with the freight or passenger departments should be addressed to the head of such department."

**Louisville, New Albany & St. Louis.**—The board has elected St. John Boyle, President; Morris McDonald, Vice-President; George Lyman, Secretary and Treasurer; Bennett H. Young, Attorney.

**Middletown, Unionville & Water Gap.**—At the annual meeting in Middletown, N. Y., May 30, the following directors were chosen: Grinnell Burt, W. H. Clark, D. C. Dusenberry, A. Smith, H. A. Wadsworth, M. S. Hayne, Oscar Dunn, W. E. Wood, George L. Denton, H. R. Wilcox, M. D. Stivers. The directors elected the following officers: President, Grinnell Burt; Vice-President, Asa Smith; Secretary, James N. Pronk; Treasurer, W. H. Clark. The road is leased to the New Jersey Midland.

**New Brunswick.**—This road is now operated by the trustees for account of the bondholders, the officers being as follows: Alexander Gilson, Managing Trustee; Thomas Hoben, Superintendent; Alfred Seely, Treasurer and General Ticket Agent.

**New York & Greenwood Lake.**—Mr. William P. Harris has been appointed Managing Director, and will have immediate charge of the road, in place of C. W. Douglas, Superintendent, who has resigned.

**New York, Ontario & Western.**—Mr. N. R. Hankins, for some time Acting Superintendent, has been appointed Superintendent, with office at Middletown, N. Y. Mr. Charles Clark is Purchasing Agent, with office at the same place.

**New York, Pennsylvania & Ohio.**—Mr. H. C. Hastings is appointed Assistant General Freight Agent of this company. Appointment to take effect June 5.

**Pennsylvania & New England.**—This company has been organized as successor to the South Mountain Company, by the election of the following: President, Pierce de Sagoo, Philadelphia; Vice-President, David M. Rank, East Hanover, Pa.; Directors, R. M. Jones, Bangor, Pa.; J. G. Heilmann, Jonestown, Pa.; F. R. Frill, Reading, Pa.; A. O. Hiestler, Harrisburg, Pa.; Trustees, George M. Wright, Bordentown, N. J.; Wm. H. Gatzmer, Philadelphia.

**Portland & Rochester.**—Superintendent J. M. Lunt having resigned, the general duties of the office will be performed by President and Receiver George P. Westcott. Mr. J. W. Peters, General Ticket Agent, has been appointed also Train Dispatcher.

**Portland, Saco & Portsmouth.**—At the annual meeting in Kittery, Me., June 7, the following directors were chosen: John B. Brown, George E. B. Jackson, Portland, Me.; Samuel C. Lawrence, Medford, Mass.; Wm. B. Bacon, George P. King, E. B. Phillips, Alfred P. Rockwell, Boston. The road is leased to the Eastern Company.

**Rome, Watertown & Ogdensburg.**—At the annual meeting in Watertown, N. Y., June 2, the following directors were chosen: Talcott H. Camp, Watertown, N. Y.; Solon D. Hungerford, Adams, N. Y.; Wm. M. White, Canaseraga, N. Y.; Theodore Irwin, Oswego, N. Y.; Gardner R. Colby, John S. Farlow, Boston; Samuel Sloan, Moses Taylor, Christian Zabriskie, Percy R. Pyne, John S. Barnes, Wm. E. Dodge, Roswell G. Rolston, New York. The only new director is Mr. Rolston, who succeeds John Brislin, deceased. The board re-elected Samuel Sloan President.

**St. Joseph & Des Moines.**—This road, now owned by the Chicago, Burlington & Quincy, has been placed under General Superintendent J. P. Barnard, of the Kansas City, St. Joseph & Council Bluffs, owned by the same company. He has appointed D. H. Winton Assistant Superintendent; L. H. Morse, Superintendent of bridges and buildings; W. D. Rowley, Master Mechanic; Joseph Hayward, Road Master.

**St. Mary's, Credit Valley & Huron.**—The officers of this new Ontario company are: President, John E. Harding; Vice-Presidents, A. McCorquedale, John Youngs; Treasurer, C. S. Rumsey; Engineer, J. A. Patterson.

**St. Paul & Sioux City.**—At the annual meeting in St. Paul, Minn., June 5, the following directors were chosen: J. Q. Adams, C. H. Bigelow, E. F. Drake, John L. Merriam, A. H. Wilder, St. Paul; Philletus Sawyer, Oshkosh, Wis.; P. L. Cable, Rock Island, Ill.; H. H. Porter, Chicago; H. R. Bishop, Benjamin Brewster, David Dows, J. M. Fiske, R. P. Smith, August Kountze, George L. Seney, New York. The board elected H. H. Porter, President; E. F. Drake, First Vice-President; Benjamin Brewster, Second Vice-

President; G. A. Hamilton, Secretary; R. P. Flower, Treasurer.

**Savannah & Charleston.**—The purchasers of this road at the foreclosure sale have organized a new company with the following directors: W. H. Brawley, C. C. Memminger, A. F. Ravenel, Charleston, S. C.; Wm. Cutting, Savannah, Ga.; H. B. Plant, Augusta, Ga.; B. F. Newcomer, W. T. Walters, Baltimore. The board elected H. B. Plant President. He is also President of the Savannah, Florida & Western.

**Schuylkill & Lehigh.**—This company was organized as successor to the Reading & Lehigh in Philadelphia, June 7, when the following were chosen: President, John N. Hutchinson; Directors, George F. Baer, J. Y. Humphrey, George DeB. Keim, Henry S. Eckert, G. A. Nichols, George D. Stitzland. The road is worked by the Philadelphia & Reading.

**Selma & Greensboro.**—Mr. A. M. Fowlkes (formerly Receiver) has been appointed Superintendent, in place of E. W. Rucker, resigned.

**Vermont & Massachusetts.**—At the annual meeting in Boston, June 2, the following directors were chosen: D. S. Richardson, Wm. H. Hill, James A. Dupee, Francis Goodhue, George F. Fay, Thornton K. Ware, E. L. Davis. The road is leased to the Fitchburg Company.

**Western North Carolina.**—The following are the officers of the company which has bought this road from the state of North Carolina: President, W. J. Best; Vice-President and Superintendent, Col. A. B. Andrews; Secretary, Mr. Caddogan; Treasurer, Col. W. E. Anderson; Assistant Treasurer, Capt. G. P. Erwin; Chief Engineer and Engineer in charge of construction, Major J. W. Wilson; Assistants, Col. Thad. Coleman and Capt. Wm. Cain.

Major Wilson was President and Chief Engineer, and Mr. Erwin Treasurer under the state organization. Col. Andrews is Superintendent of the North Carolina Division of the Richmond & Danville road. The company will have its office in Asheville, N. C., and also an office in New York.

**Worcester.**—At a meeting held in Snow Hill, Md., May 25, Dr. George W. Bishop was re-elected President. The road is controlled by the Old Dominion Steamship Company.

**Yard Masters' Mutual Benefit Association.**—At the annual convention in Boston, June 9, the following officers were chosen: President, George W. Evans, Denver, Col.; Vice-Presidents, James A. Washburne, Concord, N. H., and Edwin Adams, Hannibal, Mo.; Secretary and Treasurer, Joseph Fanga, Indianapolis.

## PERSONAL.

—Major B. H. Greene, formerly Chief Engineer of the New Orleans Pacific road, and an engineer of wide experience, has been appointed State Engineer of Louisiana.

—Mr. Foster Morris, Chief Engineer of the Shenandoah Valley Railroad, was married at Charlestown, W. Va., June 9, to Miss Lucy M. Packett, daughter of the late John B. Packett, of Charlestown.

—Mr. C. W. Seofield, of New York, President of the Utah & Pleasant Valley and the Wasatch & Jordan Valley companies, and a heavy contractor and dealer in iron, has been compelled to stop payment. His embarrassments have been caused by the fall in iron, and he claims that he will be able to meet all obligations, if a little time is given him.

—Baron M. M. von Weber arrived in New York last Tuesday, commissioned by the German Empire to study our canals, river improvements and cheap railroads, narrow-gauge and others. He will, probably, next week go to New Orleans to examine the improvement of the mouth of the Mississippi, and will afterward visit the Northwest.

—Mr. Gilson Romans, formerly of New York, but for some time a resident of London, died in San Francisco, where he had gone on business, May 12. He was at one time Vice-President of the Great Western of Canada, and was associated with James McHenry in arranging the coup d'état by which the Gould management of the Erie was overthrown. By the rise in Erie stocks that ensued he is said to have made an enormous fortune.

—Mr. C. N. Scott, for some time Treasurer and General Freight and Passenger Agent of the Port Dover & Lake Huron road, has resigned to accept a position on the Northern Pacific road at Portland, Oregon. The employees of his old road met Mr. Scott at Woodstock, Ont., May 10, and presented him with a complimentary address and a very handsome gold chain and locket. At the same time Mrs. Scott was presented with a valuable gold pencil.

—We regret to announce the death, at Aspinwall, May 30, of Arthur Livermore Ford, C. E., son of an old and highly esteemed member of the engineering profession, Mr. James K. Ford, now of Oswego, N. Y. Young Ford went to Panama a few months ago to reconstruct the foundations of a bridge that was destroyed by the floods last fall, and had nearly completed his work when he was carried away by a fever prevailing in that country at the time. At his death he was but 29 years of age, but he had already given evidence of decided ability in his profession, in which he had been most thoroughly trained, and of the high character which adorns any position or calling; while his rare amiability and the heartiness of his friendships make his loss singularly painful to those who had the good fortune to know him, as it must be agonizing to the members of his family, who had good reason for pride as well as affection in the young man. Mr. Ford had had much experience in Spanish American countries. For some time he was engaged on a railroad in Cuba, and for several months in Nicaragua, and considered himself well acclimated in the tropics.

## TRAFFIC AND EARNINGS.

### Peoria Shipments Eastward.

A new apportionment has been made by the arbitrators of the Joint Executive Committee, which applies back to cover shipments from April 1. It takes the place of an award made Dec. 18 last, and the percentages awarded each road are as follows by the two awards:

	Award of—	
	April 1.	Dec. 18.
Toledo, Peoria & Warsaw	36	37
Indiana, Bloomington & Western	24	25
Chicago, Rock Island & Pacific	16	20
Illinois Midland	10	4
Peoria, Decatur & Evansville	5	5
Chicago, Pekin & Southwestern	5	5
Peoria, Pekin & Jacksonville	4	4

The change thus consists in taking 4 per cent. from the Rock Island and 1 per cent. each from the Warsaw and the Indiana, Bloomington & Western and giving it to the Illinois Midland. The award covers all east-bound traffic from Peoria, whether originating there or passing through it from competitive points beyond, except shipments from Pekin and on through bills of lading from local points west of Peoria on the Warsaw and the Rock Island & Peoria roads.

The arbitrators consider it essential that Pekin shipments



should be included with those of Peoria, or else themselves be apportioned, and recommend that they be regularly reported to the Peoria joint agent.

#### Railroad Earnings.

Earnings for various periods are reported as follows:

Five months ending May 31:				
	1880.	1879.	Inc. or Dec.	P. c.
Central Pacific.....	\$6,749,539	\$6,412,278	I. \$337,261	5.3
Chi. & Alton.....	2,786,099	1,730,118	I. 1,055,981	60.3
Chi. & Eastern Ill.....	439,468	321,878	I. 117,590	36.5
Chi., Mil. & St. Paul.....	4,409,000	3,336,501	I. 1,072,499	32.2
Denver & Rio Grande.....	758,500	.....	.....	.....
Flint & Pere Marquette.....	621,739	444,214	I. 177,525	40.0
Grand Trunk.....	3,984,543	3,432,176	I. 552,367	16.1
Hannibal & St. Jo.....	939,150	782,499	I. 156,651	20.0
Ill. Cen., Ill. lines.....	2,278,917	2,068,289	I. 210,628	10.2
Iowa lines.....	631,870	588,035	I. 43,835	7.5
Int. & Gr. Northern.....	612,520	596,594	I. 15,926	2.7
Mo., Kansas & Texas.....	1,673,700	1,020,008	I. 653,692	63.9
Mobile & Ohio.....	880,588	764,970	I. 115,618	16.3
N. Y. Cent. & Hudson River.....	13,089,001	11,135,145	I. 1,953,856	17.5
Og. & Lake Champlain.....	106,133	113,105	I. 6,972	46.9
St. L., A. & T. H., Main Line.....	573,295	331,078	I. 242,217	55.0
St. L., A. & T. H., Belleville Line.....	255,880	213,030	I. 42,850	20.1
St. L., Iron Mt. & So. St. L. & San. Fran. Toledo, Peo. & War-saw.....	2,278,259	1,647,174	I. 631,085	38.3
Wabash, St. L. & P.....	4,361,709	2,993,639	I. 1,368,070	45.5
Four months ending April 30:				
Del. & Hudson leased lines.....	\$1,001,346	\$1,201,470	I. \$199,876	33.2
Net earnings.....	694,097	455,704	I. 238,393	52.3
N. Y., Lake Erie & Western.....	5,830,708	5,083,798	I. 746,910	14.8
Net earnings.....	2,115,655	1,278,531	I. 837,124	65.5
N. Y., Penna. & Ohio.....	1,687,839	1,205,904	I. 481,935	39.3
Month of April:				
Albany & Susquehanna Del. & Hudson, Pa. Div.....	\$120,558	\$78,958	I. \$41,600	52.6
Gal., Har. & San. Antonio.....	98,381	88,942	I. 9,439	10.6
Great Western.....	95,204	85,412	I. 9,792	11.6
Net earnings.....	351,900	295,100	I. 56,800	19.3
N. Y., Lake Erie & Western.....	1,643,151	1,372,755	I. 270,396	19.7
N. Y., Penna. & Ohio.....	394,101	330,812	I. 63,289	19.1
N. Y. & Canada.....	34,139	32,810	I. 1,329	4.0
Rensselaer & Saratoga.....	164,598	110,586	I. 54,012	49.7
Month of May:				
Central Pacific.....	\$1,731,000	\$1,579,591	I. \$151,409	9.6
Chicago & Alton.....	602,132	424,936	I. 177,196	41.7
Chicago & Eastern Ill.....	111,800	65,335	I. 46,465	55.8
Chi., Mil. & St. Paul.....	1,135,000	857,323	I. 277,677	32.4
Denver & Rio Grande.....	191,093	.....	.....	.....
Flint & Pere Marquette.....	115,939	88,729	I. 27,210	30.7
Hannibal & St. Jo.....	180,125	134,071	I. 46,054	34.3
Ill. Cen., Ill. lines.....	497,134	443,332	I. 53,802	11.6
Iowa lines.....	129,720	130,128	D. 408	0.3
Int. & Gr. Northern.....	9,842	84,630	I. 74,788	757.1
Mo., Kansas & Texas.....	274,023	217,834	I. 56,189	26.1
Mobile & Ohio.....	130,148	117,592	I. 12,556	10.7
N. Y. Cen. & Hud. Riv. Og. & Lake Champlain, St. L., A. & T. H., Main Line.....	2,540,988	2,211,011	I. 329,977	14.9
St. L., A. & T. H., Belleville Line.....	44,108	30,619	I. 13,489	44.0
St. L., Iron Mt. & So. St. L. & San. Fran. Toledo, Peo. & War-saw.....	99,235	63,210	I. 36,025	57.0
Wabash, St. L. & P.....	50,170	37,163	I. 13,007	35.1
Third week in May:	372,280	302,641	I. 69,639	23.0
Week ending May 29:	109,874	81,221	I. 28,653	35.3
Grand Trunk.....	119,730	108,880	I. 10,850	10.0
Week ending May 29:	946,176	565,085	I. 381,091	67.4
Week ending May 29:	\$175,221	\$145,838	I. \$29,383	20.2

#### Grain Movement.

For the week ending May 29 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets, and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

Northwestern shipments.				
Year.	Northwestern receipts.	Total.	By rail.	P. c.
1874.....	5,324,037	5,005,175	1,280,734	25.0
1875.....	2,641,087	2,709,001	1,080,895	39.0
1876.....	4,036,853	4,210,084	1,797,922	42.7
1877.....	2,835,626	2,114,639	824,902	39.0
1878.....	6,556,985	5,045,362	2,004,090	39.7
1879.....	6,160,029	5,087,244	2,892,298	55.7
1880.....	8,806,172	6,190,472	1,505,114	25.0

The receipts of the Northwestern markets for the week this year, are the largest ever known in any week save one and 41½ per cent. more than in the preceding week. Here-tore the largest receipts in single weeks before harvest have been 6,524,578 bushels in the week ending June 7, 1879, and 6,556,985 bushels in the week ending June 1, 1878. And there have been but five weeks before at any time of the year when the receipts of these markets were as much as 8,000,000—three weeks in August and one in September of 1878, and the week ending October 4, last year. The one week when receipts were greater than last week was that ending Aug. 24, 1878, when they were 9,015,180 bushels. The shipments of these markets were nearly a fifth larger than the week before, but have been largely exceeded one week this year (the first of open navigation, when the whole grain fleet sailed at once, as it were), but only twice last year and never in any earlier year before navigation opened, and very seldom in the fall even. The receipts of Atlantic ports were 52 per cent. more than the week before and half a million bushels more than the largest receipts of any week before harvest previous to this year.

Of the receipts at Northwestern markets, Chicago had 62 per cent.; St. Louis, 9.8; Toledo, 8.2; Peoria, 7.3; Milwaukee, 6.7; Detroit, 3.1; Duluth, 2, and Cleveland, O., 0.9 per cent. Chicago's receipts were the largest on record and were three-fourths corn, and included 73 per cent. of the total corn receipts of the eight markets; but Chicago was also the largest wheat receiver, having nearly one-third of the whole.

Of the receipts at Atlantic ports, New York had 55.5 per cent., Philadelphia 18.4, Baltimore 11.8, Boston 6.0, Montreal 5.7, New Orleans 2.5, and Portland 0.1 per cent. There is a great increase at New York, compared with the previous week, but Philadelphia and Baltimore also have large receipts, having gained greatly within a few weeks. The receipts of New Orleans are the smallest since February, and they have been so small but four times this year. Through-out May New Orleans receipts were light, indicating that the river does not easily bear the competition of lake and canal rates. The receipts there during the four weeks ending May 1 were 2,352,809 bushels; during the next four weeks they have been but 1,057,551, or less than half as much.

For the week ending June 2, receipts at four Eastern ports were:

	New York.	Baltimore.	Phila-delphia.	Boston.	Total.
1880.....	3,275,078	1,011,554	980,200	288,267	5,555,099
1879.....	3,223,399	850,367	1,583,400	392,700	6,049,866

Inc. 1880 51,679  
Dec. 1880.....  
This is an increase of 1.6 per cent. at New York and 19

per cent. at Baltimore, and a decrease of 38 per cent. at Philadelphia and 26 per cent. at Boston, and in the aggregate of the receipts of the four ports there is a decrease of 8.2 per cent. Of the New York receipts this year, 1,367,156 bushels, or 41.7 per cent. were by rail this year, against 1,743,686 bushels, or 54.1 per cent., last year.

Buffalo receipts and shipments for the same week were:

Receipts.				
	1880.	1879.	1880.	1879.
By water.....	2,960,200	1,773,614	1,916,762	1,093,461
By rail.....	673,100	929,400	1,322,000	1,058,905
Total.....	3,633,300	2,703,014	3,238,762	2,152,366

Here is a decrease of 28 per cent. in rail receipts with an increase of 69 per cent. in lake receipts; but an increase of 25 per cent. in rail shipments, as well as one of 75 per cent. in canal shipments. East of Buffalo, therefore, the railroads were getting a quarter more traffic as well as about twice as high rates as in the corresponding week of last year.

#### Coal Movement.

Anthracite coal tonnages are reported as follows for the five months ending May 29, the tonnage in each case being only that originating on the line to which it is credited:

	1880.	1879.	Inc. or Dec.	P. c.
Phila. & Reading.....	2,145,402	2,754,937	D. 609,535	22.1
Northern Central, Shamokin Div. and Summit Branch R. R.....	275,284	309,841	D. 34,557	11.2
Sunbury, Hazleton & Wilkesbarre.....	5,831	9,715	D. 3,884	40.4
Pennsylvania Canal.....	55,484	87,070	D. 31,586	2.5
Central of N. J., Lehigh Div. & Lehigh Valley.....	1,350,238	1,530,003	D. 179,765	11.7
Lehigh Valley.....	1,549,005	1,531,541	I. 17,464	1.1
Pennsylvania & N. Y.....	10,023	9,344	I. 679	10.5
Delaware, Lack. & West.....	1,320,937	1,345,984	D. 25,047	18.6
Del. & Hudson Canal Co.....	1,202,338	1,173,840	I. 28,498	2.4
Pennsylvania Coal Co.....	367,160	525,500	D. 158,340	30.1
State Line & Sullivan.....	16,841	21,496	D. 4,655	21.5
Total anthracite.....	8,328,549	9,299,850	D. 971,301	10.4

The anthracite trade is reported dull and unsettled. Consumers generally are holding off in hopes of a break in the present understanding between the companies, and consequent lower prices. The half-time system still continues to be maintained, and it is thought that it will continue, especially as the policy of the Reading appears to be settled, and there are no present prospects of a break.

The anthracite tonnage of the Belvidere Division, Pennsylvania Railroad, for the five months, was as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Coal Port for shipment.....	9,634	1,037	I. 8,597	833.0
South Amboy for shipment.....	156,323	190,914	D. 34,591	18.1
Local distribution on N. J. lines.....	188,963	134,673	I. 54,290	41.0
Co.'s use on N. J. lines.....	41,139	33,018	I. 8,121	24.3
Total.....	396,119	359,642	I. 36,477	10.1

Of the total this year 311,984 tons were from the Lehigh and 84,135 tons from the Wyoming Region. The increase was in Lehigh coal entirely, the Wyoming Region showing a decrease over the road.

Actual tonnage of anthracite passing over the Pennsylvania & New York road for the six months of its fiscal year from Dec. 1 to May 29 was: 1880, 313,957; 1879, 409,392; decrease, 95,435 tons, or 23.3 per cent. Of the total tonnage this year 196,308 tons came from the Lehigh Valley road; 85,714 tons from the Bloomsburg Division, Delaware, Lackawanna & Western; 21,348 tons from the State Line & Sullivan, and 10,586 tons from the Pleasant Valley Branch.

Semi-bituminous tonnages for the five months ending May 29, were as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Cumberland, all lines.....	802,219	567,061	I. 235,158	41.5
Huntingdon & Broad Top.....	95,150	59,604	I. 35,546	59.2
East Broad Top.....	35,505	28,001	I. 7,504	27.1
Tyrone & Clearfield.....	493,900	583,429	D. 89,529	15.9
Belleville & Snow Shoe.....	29,084	16,300	I. 12,784	77.4
Total semi-bituminous.....	1,455,048	1,253,055	I. 201,993	16.3

Clearfield shows the effects of the long strike. The Cumberland Region is making an enormous out-put this year. The distribution of Cumberland tonnage was as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Balt. & Ohio R.R.....	551,784	350,291	I. 201,493	57.5
Bedford Div., Pa. R. R.....	107,835	70,949	I. 36,886	51.9
Ches. & Ohio Canal.....	143,251	140,472	I. 2,779	1.9
Total.....	802,870	567,712	I. 235,158	41.4

Local consumption must account for the slight difference between the totals here and those given above, which are the total tonnage over the Cumberland & Pennsylvania road and Cumberland Branch.

Actual tonnage passing over the Huntingdon & Broad Top road for the five months was:

	1880.	1879.	Inc. or Dec.	P. c.
Broad Top coal.....	55,150	59,604	D. 4,454	7.5
Cumberland coal.....	111,600	73,921	I. 37,679	50.9
Total.....	166,750	133,525	I. 33,225	24.9

The Broad Top is mined on the line; the Cumberland carried through from Mt. Dallas to Huntingdon for the Pennsylvania Railroad Company. The increase in Broad Top is partly due to the blowing in of local furnaces.

Bituminous tonnages reported for the five months are as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Barclay R. R. & Coal Co. Allegheny Region, Pa. R. R.....	185,959	145,001	I. 40,958	21.4
Penn. and Westmoreland.....	156,351	73,295	I. 83,056	11.3
West Penn. R. R.....	409,943	326,060	I. 83,883	25.7
Southwest Penn. R. R.....	119,597	81,492	I. 38,105	46.7
Pittsburgh Region, P. R. R.....	25,118	10,091	I. 15,027	50.4
Total bituminous.....	1,211,897	820,955	I. 390,942	47.6

These reports include only the Pennsylvania Railroad and branches and a small region in Northern Pennsylvania. Only occasional reports are made from the coal regions of Northwest Pennsylvania, and absolutely nothing from west of Pittsburgh.

Coke tonnages for the five months were as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Clearfield and Snow Shoe.....	215	.....	215	.....
Allegheny Region, Pa. R. R.....	27,432	21,732	I. 5,700	25.3
Penn. and Westmoreland.....	59,124	36,021	I. 23,103	64.2
West Penn. R. R.....	11,061	39,010	D. 27,949	6.7
Southwest Penn. R. R.....	430,063	338,977	I. 91,086	27.2
Pittsburgh Region, Pa. R. R.....	224,929	63,953	I. 160,976	251.5
Total coke.....	783,724	409,393	I. 374,331	57.0

Dull times are reported in the Connellsville Region (South-west Penn.) from the largely increased production and the gradual falling off in demand from the slackening in the iron business.

The shipments from the Tennessee Coal & Railroad Company's Sewanee (Tenn.) mines in May were 167,261 bushels coal, and 337,742 bushels coke; total, 505,003 bushels, an increase over May, 1879, of 171,116 bushels, or 51.3 per cent.

#### Lake and Canal Rates in May.

The Buffalo Commercial Advertiser says: "The average rate of freight from Chicago to Buffalo by lake for the

month of May is larger than for any corresponding month since 1873. But it must not be inferred from this that vessel-owners are coining money. Five cents on wheat from Chicago is a fair rate only, and the fact that the showing is so favorable this year is because rates were disastrously low in preceding years.

The following statement, giving the average freight on wheat and corn from Chicago to Buffalo, and the average on the same cereals from this port to New York by canal for the month of May in the years named, will be of interest in this connection:

		Lake.		Canal.	
Year.		Wheat.	Corn.	Wheat.	Corn.
1880.....		5.0	4.3	6.0	5.5
1879.....		3.1	2.8	4.7	4.2
1878.....		2.5	2.2	5.8	5.2
1877.....		3.5	2.9	5.8	5.0
1876.....		3.9	2.7	6.7	5.8
1875.....		3.9	3.7	7.4	6.6
1874.....		4.5	4.0	11.7	10.8
1873.....		7.4	6.5	11.8	10.6
1872.....		8.0	7.4	12.8	11.8

"It will be observed that lake carriers are doing much better in proportion than those by canal, as a five-cent rate for a large vessel is more profitable than a six-cent freight for a canal boat. But carriers of all sorts should feel pretty well satisfied with results this season. So far the movement of cereals has been unprecedentedly large, and the movement the greater part of the season has been steady, giving employment to vessel-owners and boatmen.

"Another great advantage this season has been the increased shipments of ore, lumber and other coarse freights. Considerable tonnage that was engaged in carrying grain in past years is now busy in the coarse-freight trade, which, of course, materially relieves the



cylinder. In this cylinder is the mechanism which displays the ingenuity of the inventor. It is well known that a common magnet will attract wrought iron strongly, cast iron lightly and brass not at all. On the inside of the cylinder is a continuous row of magnets. As the mixture of metal falls slowly, the drum revolves and into a box in front the brass filings and bits are dropped, the iron being held by the magnets. Further around is a light brush which sweeps off the cast-iron bits into a convenient receptacle, while the wrought iron, of which there is very little, adheres in bunches to the drum and has to be cleaned off occasionally. Although there is not constant work for the separator, it has been used considerably, and found to perform its work in a satisfactory manner. It will take a very few weeks for it to pay for itself in the saving of valuable metal rendered well nigh useless by being mixed with foreign substances.—*Pittsburgh American Manufacturer.*

#### OLD AND NEW ROADS.

**Baltimore & Cumberland Valley.**—This road is now completed from the junction with the Western Maryland at Edgemont, Md., to Waynesboro, Pa., a distance of 7½ miles. Three miles of the road are in Maryland, and were finished last year; the other 4½ miles are in Pennsylvania. The road has been built in the interest of the Western Maryland, and will be worked as a branch of that road, giving it an entrance into the rich and fertile Cumberland Valley.

**Baltimore & Drum Point.**—At a recent meeting of the directors in Baltimore it was stated that arrangements had been completed for the purchase of the state interest in the Annapolis & ElkrIDGE road. It was decided to call a meeting of the stockholders to determine upon the acceptance of the recent acts of the Legislature as an amendment to the charter. It was further understood that everything looking toward the establishment of the proposed road was satisfactory, and that construction would be begun at an early day.

**Boston & Albany.**—At a meeting of the board, held June 3, it was voted to buy the Springfield & Northeastern road, subject to the approval of the stockholders.

**Brooklyn & Montauk.**—This company, successor to the Southern of Long Island and the South Side, notifies holders of South Side sinking fund bonds that certificates of preferred and common stocks are ready for delivery at the Gallatin National Bank, No. 36 Wall Street, New York, on surrender of receipts issued on the deposit of bonds, and on payment (if not already paid) of the assessment of \$10 per \$1,000 bond, as provided by the agreement of reorganization now carried out.

**Burlington & Lamoille.**—The Burlington, (Vt.) *Free Press* say: "A contract has just been concluded between the Burlington & Lamoille and Central Vermont railroads, subject to the approval of the stockholders, by virtue of which the former road obtains the use of the track, stations and sidings of the Central Vermont, on equal terms with the Central Vermont between Burlington and Essex Junction. Each road continues in the same independent position as heretofore, and the division of business between them remains the same as by the contract of January, 1879."

**Cheshire.**—At the annual meeting in Keene, N. H., June 2, the stockholders voted to ratify the lease of the Monadnock Railroad for five years, at \$12,000 a year, with the privilege of an extension. It was also voted to authorize the payment of a sufficient amount of the bonds due in July to reduce the bonded debt to \$800,000.

**Chicago & Illinois River.**—In Chicago, June 3, the United States Circuit Court entered a decree in the case of John B. Dumont against the Chicago & Illinois River Railroad Company and others, ordering that a sale of the road take place unless the claims proved up against it are paid forthwith. In December, 1878, an interlocutory decree was entered in the case, which found that the Union Rolling-Mill Company had a lien against the company and the Chicago Railway Construction Company for \$134,733.23. The decree now entered makes the interlocutory decree final, and directs the payment of the amount mentioned, together with 6 per cent. interest from the date of the entry of the interlocutory decree, to the date of payment, and that in default of payment the Master in Chancery is directed to sell all that portion of the Illinois River road extending from Joliet to the east bank of the Mazon River after giving 30 days' notice by publication. It is also decreed that the Union Rolling-Mill Company should recover from the Illinois River road, the Chicago Railway Construction Company, and the Chicago & Alton Railroad Company \$29,706.30, with 6 per cent. interest from Dec. 16, 1878, to the date of payment, and the Rolling-Mill Company is to have an execution issued for that amount in its favor.

The road is worked by the Chicago & Alton Company, and will probably be bought in by that company when sold.

**Chicago & Iowa.**—The Illinois Circuit Court has set aside the demurrer filed in the suit brought to test the validity of the election of the present board of directors (known as the Aurora board), and ordered a hearing of the case on its merits.

The United States Circuit Court has stayed the order to deliver up the road to the company, and directed the Receiver to retain possession until after the hearing in the State Court.

**Chicago & Northwestern.**—Besides the extension of this company's Dakota line to the Missouri River, which is making rapid progress, it has recently let a contract for the construction this year of a line at right angles to this north and south in the valley of the James River, for about 80 miles.

The outlet for the recently acquired narrow-gauge lines of this company will be provided by constructing a new road from Madison, Wis., some 60 miles southwestward. Part of this, toward Madison, will be of standard gauge—probably as far as Dodgeville, and the remainder, for the present, of narrow gauge. Meanwhile work is progressing on the changing of the Des Moines & Minnesota road to the standard gauge, but also with a change in route and other great improvements which will greatly reduce the cost of carrying on it.

**Chicago, Clinton, Dubuque & Minnesota.**—The Boston *Transcript* says: "The papers for the sale of the Chicago, Clinton, Dubuque & Minnesota Railroad to the Chicago, Milwaukee & St. Paul Railroad Company have been passed in Boston. The St. Paul buys the Dubuque at \$80 per share, paying therefor a forty-year 6 per cent. bond of the St. Paul company, secured by a mortgage on the Dubuque road. The bonds will date July 1, 1890, and a sinking fund of 1 per cent. per annum will be set aside for their redemption, beginning July 1, 1895. This consummates a four months' negotiation, with a trade highly advantageous to Boston interests and of considerable benefit to the purchasing company."

**Chicago, Milwaukee & St. Paul.**—The Iowa & Dakota Division is now completed to Mitchell, Dakota, 41

miles west of the late terminus at the James River, 44 miles from Marion Junction, and 331 miles from the starting point of the division at Calmar.

It is reported that the extension of the Hastings & Dakota Division is to run westward, and will probably connect with the Iowa & Dakota Division west of the James River. Great care has been taken to keep the destination of this line a secret as long as possible, and this may be only a rumor.

The cut off line from Eden on the Sioux City & Dakota Division to Rock Valley on the Iowa & Dakota Division is nearly finished, and will be completed as soon as the bridge over the Sioux River is ready.

This company pays \$50,000 for the 16 miles of the Pine River Valley & Stevens Point road, from Richland Centre, Wis., to Lone Rock, whose purchase was noted last week.

It is understood that a new issue of 6 per cent. bonds will be ready to pay for the Chicago, Clinton, Dubuque & Minnesota road, as noted elsewhere.

**Chicago, Rock Island & Pacific.**—At the annual meeting in Chicago, June 2, the stockholders voted to approve the plan for the consolidation with the company of its controlled and leased lines—the Iowa Southern & Missouri Northern, the Atlantic Southern, the Atlantic & Audubon, the Avoca, Macedonia & Southwestern and the Newton & Monroe. This consolidation fixes the capital stock of the company at \$50,000,000. At the meeting there were 188,051 shares represented (of 209,780), and of these 188,026 were voted in favor of the consolidation and only 25 against it.

The following official notice is given by the Treasurer:

"The consolidation of the capital stocks, franchises, privileges, rights, immunities, and properties of the Chicago, Rock Island & Pacific Railroad Company, the Iowa Southern & Missouri Northern Railroad Company, the Newton & Monroe Railroad Company, the Atlantic Southern Railroad Company, the Avoca, Macedonia & Southwestern Railroad Company, and the Atlantic & Audubon Railroad Company was completed on the 4th day of June, 1890. The corporate name of the new corporation is the Chicago, Rock Island & Pacific Railway Company."

"The holders of the shares of this company are entitled to two shares of the stock of the new corporation for every share held of the capital stock of this company. The certificates for the new stock will be issued only as the old certificates of this company are surrendered to the Secretary and Treasurer, at his office, at No. 13 William street, New York. All dividends hereafter will be declared upon the capital stock of the consolidated corporation, and will be paid only to those who hold its certificates. It is therefore very important that the old certificates be exchanged for the new with as little delay as possible, and prior to the closing of the transfer books, July 3, for the August dividend."

"The powers of attorney on the back of each certificate now outstanding, must, before it is surrendered, be signed by the owner whose name appears in the body of the certificate, or by his or her attorney in fact, authorized by a power of attorney duly executed and filed in the office of the Secretary and Treasurer."

"Powers of attorney now on file in the office of the Treasurer, authorizing the payment of dividends or the transfer of shares, will not be regarded as sufficient to authorize the payment of dividends hereafter declared, or the transfer of any shares of the consolidated corporation."

"Shareholders who desire that such dividends shall be paid to, or that such shares shall be transferred by, an attorney in fact, must execute and file new powers of attorney, forms for which will be furnished on application to the Secretary and Treasurer."

**Columbus & Maysville.**—A correspondent says: "At the annual meeting, held May 25, the stockholders, by a unanimous vote passed a resolution changing the gauge from 3 feet to 4 ft. 9 in."

"Nineteen miles of the road from Hillsboro south to Sardinia, O., are in operation, connecting the Marietta & Cincinnati, and the Cincinnati & Eastern. A sufficient amount of local aid has been guaranteed to build the road south from Sardinia to the Ohio River at Ripley, and thence up the river to Aberdeen, opposite Maysville, Ky., a distance of 29 miles, north from Hillsboro to Columbus, 62 miles. The prospects for the speedy completion of the road are very favorable."

**Flint & Pere Marquette.**—This company has completed a branch, known as the Round Lake Branch, from Butler Junction, 15 miles east of Ludington, Mich., north to Webber, a distance of four miles. Surveys are being made for an extension from Webber northwest 20 mile to the important lumber town of Manistee on Lake Michigan.

**Genesee Valley.**—The Governor of New York has signed the bill relating to the Genesee Valley Canal, and it is now a law. It provides for the disposing of the interest of the state in the canal at the nominal price of \$100 per mile to any corporation that will build a railroad according to any one of several conditions specified: First, to any that will within three months guarantee to build a railroad the entire length of the canal from Rochester to Millport; second, in case of failure of the first, to any that will build a railroad from Cuba to Mt. Morris; third, in case of failure of the second, to any that will build from Mt. Morris to Rochester; and fourth, in case of failure of the third, to any that will build from Cuba to Millgrove.

**Grand Southern.**—The contractor, J. N. Green, asks for bids for track-laying and ballasting on 82 miles of this road between St. John, N. B., and St. Stephen. The work is to be done by Nov. 1 next.

**Iron Mountain & Helena.**—The contract for completing this road to Forrest City, the crossing of the Memphis & Little Rock road, has been let to Jacks & Co., of Helena, Ark., and Edward L. Thomas, of Indianapolis. The work is to be done by Sept. 15. The Indianapolis Rolling-Mill is to furnish the rails and fastenings.

**Jackson & Nashville.**—This company has filed the articles of incorporation at Nashville, Tenn. The incorporators are James Fentress, L. T. Brien, H. W. Clarke, John G. Mann and Howell E. Jackson. The road has been talked about a good deal for some time; it is to run from Nashville, Tenn., west by south to Jackson, the crossing of the Mobile & Ohio and the Chicago, St. Louis & New Orleans roads. The distance is about 125 miles.

**Jacksonville Southeastern.**—This company received proposals until June 10 for grading, clearing and grubbing the line for an extension of its road from Varden, Ill., its present eastern terminus, southward about 23 miles to Litchfield, where the Decatur-St. Louis line of the Wabash crosses the Indianapolis & St. Louis. The office of the company is Jacksonville, Ill., and Wm. S. Hook is President.

**Kansas City, Ft. Scott & Gulf.**—The contracts for building the Rich Hill Branch, from Pleasanton, Kan., to the Rich Hill coal fields in Bates County, has been let to J. H. Beeson & Co., of Beloit, Kan. The distance is 25 miles, and the grading is to be done by July 15.

**Keyser & Pendleton.**—This company has filed articles

of incorporation in West Virginia. The route proposed to be established extends from a point in the town of Keyser, Mineral County, through the great valley which lies east of, and separates the Allegheny plateau from the Appalachian system of mountains to a point on the southern boundary line of West Virginia, on the Southern Hills of Pendleton County. The capital stock is fixed at \$800,000, and the chief office is to be at Keyser.

**Lehigh Valley.**—The Philadelphia *North American* says: "The project for a new line from this city to the Lehigh Valley has been abandoned. At a recent meeting of the directors of the Lehigh Valley road they voted to notify the Pennsylvania Railroad Company of this decision. The officers of the Pennsylvania road say that this action will not interfere with the construction of a line to Norristown."

**Little Rock, Mississippi River & Texas.**—A suit brought by the Little Rock & Napoleon Company to stop this Company from proceeding with work on its extension from Pine Bluff, Ark., to Little Rock, has been decided in favor of this Company. The Little Rock & Napoleon is perpetually enjoined from further interference. Work is now well advanced on the extension.

**Memphis & Little Rock.**—This company has served notice on the Southern Express Company to withdraw its lines from the road, June 14. After that time the railroad company will do its own express business.

**Montpelier & Wells River.**—It is reported that this company has agreed to break off the present running arrangement with the Central Vermont, in consideration of which it is to receive a subsidy of \$9,000 per year, to be paid jointly by the Passumpsic, the Boston, Concord & Montreal and the Portland & Ogdensburg companies. The object is to reduce competition for the White Mountain travel in Summer.

**Nashua & Lowell.**—Sealed proposals will be received at the office of C. V. Dearborn, Treasurer of this company, in Nashua, N. H., until June 18, for the purchase of \$200,000 new 5 per cent. bonds, having 20 years to run from July 1, 1890. These bonds are to be issued to fund the floating debt in accordance with a vote of the stockholders at the recent annual meeting. The company's existing funded debt is \$200,000; its net earnings last year were \$163,897, and were sufficient to pay all charges and 6½ per cent. on the stock. The new issue will fund the floating debt, but will not increase the total amount of the company's obligations.

**New York, Lake Erie & Western.**—This company makes the following statement for the seven months from Oct. 1 to April 30:

	1879-80.	1878-79.	Increase.	P. c.
Earnings....	\$10,464,485.61	\$9,144,778.44	\$1,319,707.17	14.4
Expenses....	6,725,142.72	6,422,952.84	302,189.88	4.7
Net earn....	\$3,739,342.89	\$2,721,825.60	\$1,017,517.29	37.4

The gauge of the Western Division, from Hornellsville to Dunkirk, is to change from 6 ft. to 4 ft. 8½ in., on June 23. Arrangements are now in progress and the whole work will be done in one day. No third rail has been laid on this division, except for a few miles west of Hornellsville.

**Peoria & Northwestern.**—This company has filed articles of incorporation for a railroad from Peoria, Ill., to Savannah, or some other convenient point on the Racine & Southwestern Division of the Chicago, Milwaukee & St. Paul. The incorporators are James S. Platt, Charles K. Ladd, Homer S. Kellogg, Charles B. Bogue, Edwin R. Wadsworth and Francis M. Wheeler, and the capital stock is fixed at \$1,500,000. The general officers of the company are to be at Kewanee, Ill.

**Philadelphia & Reading.**—A small default was made June 1 on the bonds of the leased Colebrookdale road, the amount due on which at that date was \$18,000. The rental of this road last year was \$28,416 greater than its net earnings.

The statement of the financial condition of the company will not be ready for several weeks yet. An appraisal of the personal property of the road will soon be begun by Messrs. J. Lowrie Bell, General Traffic Manager; William Lorenz, Chief Engineer, and J. E. Wooten, General Manager, who will make the appraisal for the Railroad Company, and W. E. C. Cox, Superintendent of the rolling-mill, Reading; S. P. Whiting, Chief Engineer, of Pottsville, and Frank Carter, the Land Agent, at Pottsville, for the Coal & Iron Company.

**Pittsburgh, Titusville & Buffalo.**—A preliminary agreement of consolidation with the Buffalo & Southwestern Company has been concluded, and will be submitted to the stockholders. By the terms of the agreement the Buffalo & Southwestern debt of \$1,500,000 is to be assumed and the holders of its stock are to receive \$200 common stock for each share of old stock, and \$150 preferred stock for each share of old preferred stock. The amount of the preferred stock is \$471,900; common stock also \$471,900. The Buffalo & Southwestern road extends from Buffalo to Jamestown, N. Y., 67 miles, and connects with the Pittsburgh, Titusville & Buffalo only over 27 miles of the New York, Pennsylvania & Ohio from Jamestown to Corry. If the consolidation is approved a new connecting line will probably be built.

**Port Royal & Augusta.**—This company announces that it has earned and will pay on July 1 a dividend or partial interest payment of 1½ per cent. on the income bonds.

**Quincy, Missouri & Pacific.**—This road is now completed to Milan, Mo., five miles west of the point last noted and 105 miles from Quincy. At Milan the road crosses the Burlington & Southwestern.

**Richmond & Allegheny.**—The work of grading, or rather of adapting the tow-path of the James River & Kanawha Canal for a road-bed, is progressing rapidly. The ties are being distributed along the 20 miles from Richmond, Va., to Basher Dam, and the rails are to be delivered very soon.

Sealed proposals will be received at the office of R. M. Temple, Chief Engineer, No. 1,104 Main street, Richmond, Va., until noon of June 24, for the grading and masonry of this road from Buchanan to the mouth of North River, 22 miles, and between Maiden's Adventure Dam and Cedar Point, 5 miles. Information as to the work can be obtained of Division Engineers George W. Kendree, Buchanan, Va., or C. M. Bolton, Richmond.

**Rochester & State Line.**—The motion made some time ago by the Attorney-General of New York for a receiver for this road was argued June 7 at Albany by Attorney-General Ward and his deputy, Mr. Ruggles, in favor of the motion, and Mr. Harris in opposition. The Attorney-General asked the appointment of William H. Crannell, of Rochester. Justice Westbrook took the matter under advisement.

**Securities on the New York Stock Exchange.**—The following securities have been placed on the lists at the New York Stock Exchange:

Chicago, Rock Island & Pacific as consolidated, stock



\$41,900,000. This takes the place of the old stock, one share of old stock to be a good delivery for two shares of new until July 3.

**Cincinnati, Indianapolis, St. Louis & Chicago**, stock 4,000,000, and first consolidated bonds, \$1,000,000. The bonds are part of a total authorized issue of \$7,500,000.

**Danbury & Norwalk**, stock, \$800,000.

**St. Louis & San Francisco**, new first-mortgage sinking-fund equipment bonds, \$1,000,000.

**Texas & Pacific**, trusted stock, \$6,173,400, represented by engraved stock-trust certificates; also first mortgage bonds on El Paso Extension, \$5,000,000 out of a total of \$15,400,000 authorized.

**Selma, Rome & Dalton**.—An appeal from the recent decision of the Alabama Supreme Court to the Supreme Court of the United States has been granted.

The appeal is from the decision giving the Alabama & Tennessee River bondholders a lien on the property prior to that of the Selma, Rome & Dalton first mortgage. It will not stay the sale of the road under the Alabama decree.

**South Mountain**.—An organization has been completed by the parties who bought this unfinished road at one of the many sales it has undergone. The new company is known as the Pennsylvania & New England, and promises to go to work at once to complete the line from Harrisburg, Pa., to Hamburg, with the branch to Reading.

**Springfield & Western Missouri**.—This road is now completed to Greenfield, Mo., 17 miles beyond the late terminus at Ash Grove, and 37 miles west by north from Springfield.

**Texas & Pacific**.—The track has now reached Weatherford, Tex., 30 miles westward from the old terminus at Ft. Worth, and regular trains began running to that point this week. A very large force is now employed on the grading west of Weatherford.

**Utah & Northern**.—Trains are now running to Red Rock, Montana, 304 miles from the southern terminus at Ogden, Utah. Work has been begun on the extension from Red Rock to Butte City, and surveys are being made beyond that point. One line is being run to Helena, about 70 miles northwest, and another north to Deer Lodge, about 85 miles.

**Wagner Sleeping-Car Company**.—The Chicago Tribune of June 7 says:

"On Saturday the Pullman Palace-Car Company began a suit in the United States District Court against the Wagner Sleeping-Car Company, claiming \$1,000,000 damages for infringement and use of patents in the construction and use of sleeping-coaches.

"In 1870 the Wagner Company began building sleeping-cars, and for several years their coaches ran only upon the New York Central Railroad and its various branches. The company, finding it impossible to build satisfactory cars, without using the Pullman patents, contracted with that company to use certain of their patented improvements. This arrangement was made with the distinct understanding that the Wagner Company were to run their cars only over the New York Central Railroad. For five years this arrangement was faithfully and amicably carried out. In 1875 the Pullman Company's contract with the Michigan Central road expired, and through the influence of W. H. Vanderbilt, the Wagner Company secured the contract to run their cars between Detroit and Chicago, the Michigan Central being Vanderbilt's Chicago connection. Trouble began at once.

"In conversation with Mr. G. M. Pullman, last evening, that gentleman told the reporter that every effort had been made by the Pullman Company to amicably settle the existing difficulty, but, however, without success. Mr. Pullman says that his company has waited five years, hoping to satisfactorily arrange the questions at issue, and now proposes to take the matter before the courts for adjudication. Mr. Wagner is in the city, being a member of the New York delegation to the National Convention, and up to midnight Saturday, the papers in the case had not been served upon him. The case will, undoubtedly, attract a great deal of attention, and it is said that the Wagner Company proposes to make a stubborn fight. Judge Lochrane, of Georgia, attorney for the Pullman Company in the South, will represent the plaintiffs upon the trial of the case."

**Western North Carolina**.—The new company, which has bought this road from the state of North Carolina, will begin work at once on the few miles remaining to complete it to Asheville. Work will also be begun on the repair and re-construction of the older part of the road, which is in bad condition. The engineers have already begun surveys on the line from Asheville to Paint Rock, and will soon begin on that from Asheville to Ducktown.

**Western Union Telegraph**.—At a meeting of the Executive Committee, June 9, the following statement was submitted (June estimated), for the quarter ending June 30:

Balance on hand..... \$824,298.50  
Net earnings for quarter..... 1,301,185.73  
Total..... \$2,025,484.32

Interest and sinking fund..... \$127,200  
New construction..... 250,000  
Patents, etc..... 120,000  
Total..... 497,200.00

Balance..... \$1,528,284.32

It was resolved to declare the usual quarterly dividend of 1% per cent., which will take \$717,570, leaving a balance of \$810,714.32 on hand.

**West Jersey & Atlantic**.—Track is now all laid on this road, and trains were to begin running this week. It leaves the West Jersey road at Newfield, N. J., 30 miles from Camden, and runs eastward to Atlantic City 34 miles, making a line from Camden to Atlantic City 64 miles long, being four miles longer than the Camden & Atlantic and nine miles longer than the Philadelphia & Atlantic City. It will be worked as a branch of the West Jersey road. It is the third line from Philadelphia to Atlantic City, and will doubtless serve to intensify the competition for the travel to that great summer resort.

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## Chesapeake & Delaware Canal.

This company owns a canal 12.63 miles long, from Chesapeake City, Md., on Elk River, an arm of Chesapeake Bay, to Delaware City, Del., on the Delaware River. It completes an inland water route between Philadelphia and Baltimore, which is navigable for vessels of considerable size, and is used by large numbers of boats of all kinds.

At the annual meeting in Philadelphia, June 7, the report for the year ending May 31, 1880, was presented, as follows:

Revenue from tolls..... \$189,804  
Received from all other sources..... 11,978  
Balance on hand May 31, 1879..... 44,550

Total..... \$246,332

Expenditures—For material, wages, repairs, interest on mortgage loan, taxes, salaries, rents, interest on borrowed money, drawbacks and over charges..... 192,537

Cash balance..... \$53,795  
Deduct five months' accrued interest..... 49,842

Surplus..... \$3,953  
The revenue from tolls was at the rate of \$15.028 per mile.

There has been, in the report proceeds, an increase of revenue from tolls of about \$30,000 for the year just ended over the preceding year. This increase precludes the necessity of resorting to the contingent fund for the payment of interest and expenses, as was the case last year. The improved condition of the general trade and business of the country will place the company, it is confidently believed, in a position, which will enable it hereafter to meet all necessary expenses, and the interest on its mortgage loan, and to apply considerable balances occurring for each year to the reduction of the loan.

## Atchison, Topeka & Santa Fe.

On Dec. 31, 1879, the close of the year covered by its last annual report, this company worked the following lines:

Miles.
Atchison, Topeka & Santa Fe, Atchison, Kan., to Colorado lines..... 470.58
Pueblo & Arkansas Valley, Colorado line to Pueblo, Col..... 147.61
Pueblo & Arkansas Valley, La Junta to New Mexico line..... 96.20
New Mexico & Southern Pacific, Colorado line to Las Vegas..... 241.81
Kansas City, Topeka & Western, Topeka to Kansas City..... 118.20
Pleasant Hill & De Soto, De Soto, Kan., to Pleasant Hill, Mo..... 66.32
Florence, Eldorado & Walnut Valley, Florence, Kan., to Eldorado..... 34.80
Wichita & Emporia, Newton, Kan., to Wichita..... 29.32
Kansas City, Emporia & Southern, Emporia, Kan., to south line of Greenwood Co..... 27.28
Elk & Chautauqua, Greenwood Co., line to Howard..... 63.70
Marion & McPherson, Florence, Kan., to McPherson..... 12.40
Cowley, Sumner & Ft. Smith, Wichita, Kan., to Arkansas City..... 47.30
Cowley, Sumner & Ft. Smith, Mulvane to Wellington..... 51.30
..... 16.30
Total..... 1,181.40

Additions during the year were the New Mexico & Southern Pacific, 118.2 miles; Kansas City, Emporia & Southern, 63.7; Elk & Chautauqua, 12.4; Marion & McPherson, 47.3; Cowley, Sumner & Ft. Smith, 67.6, making 309.2 miles in all. Since the close of the year the New Mexico & Southern Pacific has been extended from Las Vegas to Albuquerque, 132 miles, with a branch to Santa Fe, 18 miles; work is in progress on the extension of that line from Albuquerque to El Paso, also in Kansas on lines from McPherson to Lyons, 30 miles; Wellington to Caldwell, 25 miles, and from Burlington to Manhattan, 50 miles. The company also, in 1879, graded nearly all of a line from Canon City to Leadville, and laid 22 miles of track thereon, but this line has now been turned over to the Denver & Rio Grande under agreement and in settlement of litigation.

The Land Department reports that patents for 2,474,326.47 acres have been received from the United States, and 458,457.58 acres are due, making a total of 2,932,784.05 acres, whereof 949,382.00 acres had been sold up to Dec. 31, 1879. Sales in 1879 were 104,744.41 acres for \$494,353.73, an average of \$4.7196 per acre. Average expenses and commissions were 84.12 cents per acre. The cash received by the Department in 1879 was \$592,344.63, of which \$198,373.21 was from sales of 1879, and \$393,971.42 for deferred payments. The Land Department holds \$2,463,854.21 in land notes. Up to Dec. 31, last, the Land Department had received \$3,053,388.11, of which \$2,295,759.63 had been paid over to the Treasurer of the company.

The balance sheet is as follows:

Stock..... \$12,634,400.00	
Bonds..... 14,136,500.00	
Construction notes due in 1882..... 78,000.00	
Pueblo & Ark. Val. stock in trust..... 850,200.00	
Notes, rentals, etc., payable..... 978,081.18	
Unpaid coupons, January and February interest..... 681,208.29	
Income account, balance..... 2,080,693.67	
Total..... \$31,439,083.14	
Road and equipment..... \$25,065,300.41	
Kansas City, Topeka & Western stock..... 1,794,300.00	
Denver & Rio Grande stock in trust..... 850,200.00	
Pueblo & Ark. Val. stock, etc..... 437,311.62	
Trustees of land income bonds..... 77,574.41	
Stocks and bonds..... 621,931.83	
Pottawottamie land account..... 214,633.00	
Sundry accounts, loans, etc..... 999,389.21	
Cash on hand and balance due..... 284,401.84	
Land Department..... 515,708.02	
Materials and cash, Western office..... 578,332.80	
Total..... \$31,439,083.14	

During the year stock to the amount of \$4,019,400 was issued, \$145,300 on account of "Circular 46," \$2,079,900 on account of Equipment fund, and \$1,794,300 in exchange for Kansas City, Topeka & Western stock. There were \$150,000 land-grant bonds redeemed during the year. The Pottawottamie bonds have all been retired, \$6,000 having been returned through the Land Department, and \$407,000 bought by the company. The balance of income account is made up by \$10,700.41 excess of cost of road over stock and bonds; \$1,245,227.05 stocks and bonds, good but not saleable at present; \$621,931.83 stocks and bonds saleable at any time, and \$202,834.88 cash and supplies on hand.

The income account, condensed, was as follows:

Gross earnings..... \$6,381,442.51  
Rental narrow-gauge stock..... 23,081.22  
Interest, dividend, sundry returns on investments..... 167,692.95  
Pottawottamie land account, balance..... 139,322.29

Total..... \$6,711,538.97  
Expenses and taxes..... \$2,926,474.89  
Legal expenses, etc..... 40,490.43  
Rental of equipment..... 36,065.08  
Rental of leased lines..... 839,772.05  
Coupons and exchange..... 795,446.50  
Dividends..... 691,311.00  
Sundry losses..... 72,813.78

Balance for the year..... \$1,311,565.24  
Balance from previous years..... 709,128.43

Total..... \$2,080,693.67

The traffic for the year was as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Train mileage.....	1879.	1878.		
Passenger.....	792,454	602,840	I.	189,614 31.4
Freight.....	2,001,066	1,179,132	I.	822,534 69.7
Service and switching.....	571,312	339,963	I.	231,349 68.0

Total.....	3,365,432	2,121,935	I.	1,243,497 58.6
Cost of motive power.....	21.26 cts.	21.87 cts.	D.	0.61 ct. 2.9
Mileage of pass. cars.....	4,752,549	3,275,582	I.	1,476,967 45.1
Mileage of freight cars.....	37,340,539	23,468,037	I.	13,881,502 59.2
Passengers carried.....	314,301	217,105	I.	97,196 44.8
Tons freight carried.....	802,121	611,086	I.	191,035 31.3

Of the freight-car mileage 66.3 per cent. was of loaded cars; foreign freight cars made 9,429,136 miles over the road, or about one-fourth of the total. At the beginning of the year local passenger rates were reduced from 6 to 4 cents per mile.

The earnings were as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Passengers.....	\$1,353,230.62	\$987,496.50	I.	\$365,734.12 37.0
Freight.....	4,893,434.95	2,826,483.34	I.	2,066,951.61 72.8
Mail and express.....	138,540.84	123,828.17	I.	11,712.67 9.2
Miscellaneous.....	6,236.10	10,060.08	D.	3,823.98 38.1
Total.....	\$6,381,442.51	\$3,950,868.09	I.	\$2,430,574.42 61.5
Expenses.....	2,926,474.89	2,041,472.43	I.	885,002.46 43.3

Net earnings.....	\$3,454,967.62	\$1,909,395.66	I.	\$1,545,571.96 80.9
Gross earnings.....	6,400.96	4,892.72	I.	1,508.24 30.8
Net earnings per mile.....	3,405.55	2,590.97	I.	944.50 37.5
Per cent. of exps. ....	45.85	51.67	D.	5.82 11.3

There were used in renewals during the year 7,929 tons of steel rails, 1,368 tons iron rails and 279,677 new ties. There were 16.07 miles new sidings laid. Two wooden spans of the bridge over the Kansas at Topeka were replaced by iron; 644 feet truss bridge renewed and one Howe truss of 88 feet span built. Large additions were made to the buildings at Topeka, Emporia and Nickerson, and a number of stock yards, freight houses, water tanks, etc., built.

Charges for new construction (outside of new branches and extensions) were \$214,318.28.

The Denver & Rio Grande road was worked from Dec. 14, 1878, to June 11, 1879, when that company took forcible possession. It was restored to this company by decree of Court July 16, but on Aug. 14 turned over to a receiver. Its operations are not included above.

Charges to equipment fund were \$996,981.71. The new equipment includes 15 passenger, 3 parlor, 4 baggage and 5 postal cars; 200 flat, 100 coal, 600 box, 150 combination and 13 way cars; 36 locomotives. There were also bought of narrow-gauge rolling stock for use on the Denver & Rio Grande and the Leadville line, 5 engines, 7 passenger, 50 box and 130 flat cars.

There were bought for account of the New Mexico & Southern Pacific Company 150 flat, 150 coal and 50 combination cars.

President Nickerson's report says: "The present year has been one of great activity and more than usual progress. Since the last report three branch lines have been constructed in Kansas, adding 191 miles to your lines in that State. In New Mexico to the present date (May 1), 268.48 miles have been built, adding about 459.48 miles to the lines operated and controlled by your company.

"Trains are now running into the city of Santa Fe and to Albuquerque on the Rio Grande. The property of the company has been materially improved, and we are now in better condition as to equipment and outfit than ever before and well prepared to handle our increasing business.

"The following table will give the stockholders an adequate idea of the progress which the company has made during the past six years:

Year.	Miles operated at close of year.	Gross earnings.
1874.....	5,38.68	\$1,250,805.60
1875.....	711.61	1,520,358.31
1876.....	711.61	2,486,582.66
1877.....	786	2,679,106.51
1878.....	808.54	3,950,868.09
1879.....	1,167.56	6,381,442.51
1880 (May 1).....	1,317.84	

"The first dividend on the capital stock was paid Aug. 25, 1879, with every prospect of regular dividends hereafter.

"While the road has been thus vigorously advanced over the plains and through the mountains, at the home office the year has been one of notable events in the history of the corporation.

"Several very important negotiations have been carried to successful completion. By these negotiations, the company secures the control of the Pueblo & Arkansas Valley Railroad and the New Mexico & Southern Pacific Railroad. "The company now has under its own management a continuous road from the Missouri River to the Rocky Mountains and to the Rio Grande.

"Another negotiation, which required nearly six months to complete, secures to your company an interest in the valuable franchise of the Atlantic & Pacific Railroad Company, which gives your road a right of way across Arizona and California to the Pacific Coast.

"Your company, jointly with the St. Louis & San Francisco Railway Company, will build a new road from Albuquerque along the thirty-fifth parallel, which in due time will form part of a trans-continental line. The money for building 600 miles of this new road is being subscribed, and the work is now being pushed with all possible energy. The completion of this line must be of great value to your property."